A DISSERTATION ON

DEGREE, DURATION AND CAUSES OF VISUAL LOSS IN UVEITIS

M.S. DEGREE BRANCH (III)

OPHTHALMOLOGY

THE TAMILNADU

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DECLARATION

I, Dr. C. VIDHYA solemnly declare that the dissertation titled "DEGREE, DURATION AND CAUSES OF VISUAL LOSS IN UVEITIS" has been prepared by me.

This is submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai, in partial fulfilment of the requirement for the award of M.S., degree (Branch III Ophthalmology) Examination to be held in MARCH 2007.

Place : Madurai

Date : **Dr. C. VIDHYA**

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CONTENTS

INTRODUCTION

The uvea is the middle vascular tract of eyeball. Inflammation of uveal tract is called uveitis. It is one of the most under diagnosed and under treated condition in ophthalmology . Being highly vascular , it is the main source of nutrition to the eyeball . For the same reason , it is an important source of hematogenous dissemination from and into the eye . It consists of three parts namely – iris , ciliary body and choroid. Except for the anterior surface of iris , most of it is hidden between the other two layers and require special investigative techniques for diagnosis . It is very sensitive due to the rich innervation and obviously due to above reasons, it responds to any insult to the eyeball by getting inflamed .

ANATOMY

ANATOMY OF THE UVEAL TRACT

The term 'Uvea' is derived from the greek word 'UVA' i.e. grape. Uveal tract is the middle coat of the eyeball. It is the most vascular layer of the eye.

It comprises of three continuous parts namely, iris, ciliary body and choroid.

IRIS

It is the most anterior part of the uveal tract. It is a thin mobile diaphragm ,dark brown to light blue in colour. It has two zones – pupillary and ciliary zones separated by collarette. Histologically , the iris consists of the following layers –

1. Anterior limiting membrane
2. Stroma – composed of collagenous connective tissue, sphincter and dilator muscles, blood vessels and nerves
3. Anterior epithelial layer
4. Posterior pigmented epithelium

CILIARY BODY

It forms a girdle, 6mm in width, extending from ora serrata to scleral spur anteriorly. It has 2 parts namely,

(i) pars plicata – anterior 2mm of ciliary body, with ciliary processes

(ii) pars plana – posterior 4mm

Histologically, it is composed of 4 parts inside outwards :

(i) non pigmented ciliary epithelium
(ii) pigmented ciliary epithelium
(iii) stroma
(iv) ciliary muscles

CHOROID

It extends from ora serrata to optic nerve head. It is comosed of the following layers from outside inwards:

(i) suprachoroidal lamina of fusca
(ii) vascular layer - Haller's layer, sattler's layer and choriocapillaries
(iii) Bruch's membrane

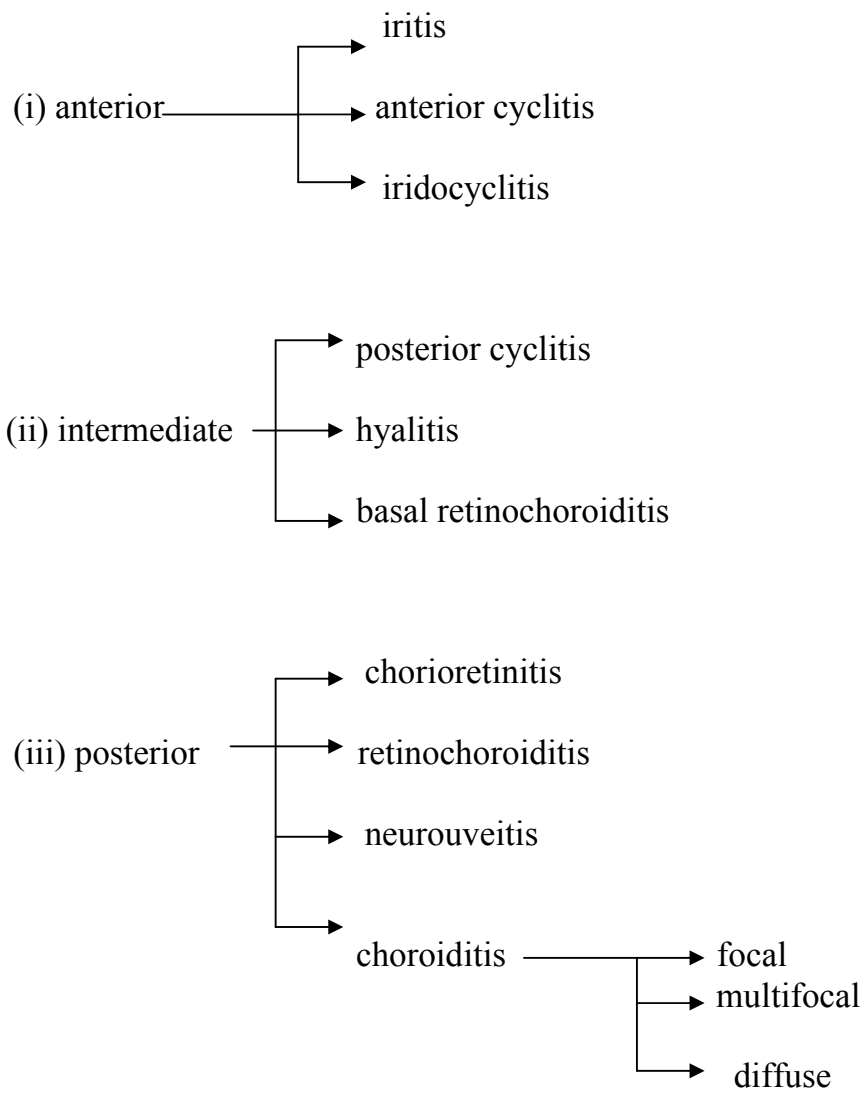
Uveitis is one of the vision threatening ocular disorder responsible for 10% of legal blindness.

CLASSIFICATION OF UVEITIS

Uveitis may be classified on the basis of

(a) anatomy
(b) aetiology
(c) clinical features
(d) pathology

ANATOMICAL CLASSIFICATION



(iv) panuveitis

AETIOLOGICAL CLASSIFICATION (DUKE ELDER'S)

(1) uveitis wherein the infective element is dominant:

(a) exogenous – 1.wound infection

2. parasitic entry

(b) from neighbouring structures by direct continuity

1.extraocular

2.ocular

(c) endogenous – metastatic / occurring in the course of general infection – bacterial , viral , rickettsiae , mycotic , parasitic

(2) uveitis wherein the element of hypersensitivity is dominant:

(a) anaphylactic / atopic uveitis

(b)uveitis due to bacterial (delayed) allergy

(c)autoimmune uveitis

(d)focal infections

(3) toxic uveitis :

(a) endogenous toxin

(i) auto-intoxication

(ii)organismal toxins

(b) endocular toxin – hemorrhagic / neoplastic

(c) exogenous chemical irritants

(4) traumatic uveitis

(5) uveitis associated with non – infective systemic diseases

(a) sarcoidosis

(b) collagen related diseases

(c) diseases of CNS

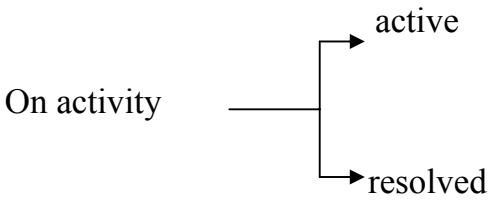
(d) diseases of skin

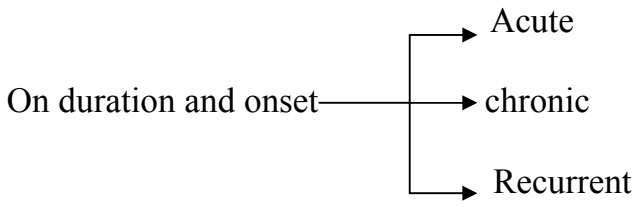
(6) uveitis of unknown etiology

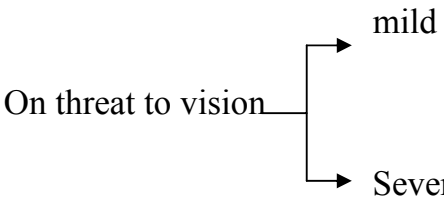
(a) sympathetic ophthalmitis

(b) heterochromic iridocyclitis

CLINICAL CLASSIFICAION







PATHOLOGICAL CLASSIFICATION

(1) Suppurative or purulent uveitis

(2) non – suppurative uveitis → granulomatous

non-granulomatous

DEFINITIONS

- ANTERIOR UVEITIS :

  → Iritis – Inflammation predominantly involving the iris

  → cyclitis – inflammation predominantly involving the ciliary body

  → iridocyclitis – inflammation affecting both the iris and ciliary body , usually to the same degree

- INTERMEDIATE UVEITIS :

  Inflammation largely involving the parsplana and post oral uveal tract.

- POSTERIOR UVEITIS :

  Inflammation limited to the posterior segment of the eye, particularly the retina and choroid

- PANUVEITIS

  Inflammation involving all the segments of the uvea, typically with a severe sight reducing inflammatory response.

- ACUTE UVEITIS:

  Uveitis lasting for a period of less than two weeks

- CHRONIC UVEITIS:

  Uveitis lasting for a period of greater than four to six weeks

- PURULENT UVEITIS:

It includes endophthalmitis and panophthalmitis

Endophthalmitis:

Panuveitis with inflammation of and exudation into the vitreous cavity.

Panophthalmitis:

It is spread of inflammation in endophthalmitis across the sclera to involve the extraocular tissues

CAUSES OF UVEITIS

ANTERIOR UVEITIS[19]

Idiopathic
Ankylosing spondylitis
Reiter's syndrome
Psoriatic arthritis
Behcet's disease
HLA-B27-associated disease
Juvenile rheumatoid arthritis
Fuch's heterochromic iridocyclitis
Sarcoidosis
Syphilis
Glaucomatocyclitic crisis
Masquerade syndromes

INTERMEDIATE UVEITIS[19]

sarcoidosis
inflammatory bowel diseases
multiple sclerosis
lyme disease
pars planitis

POSTERIOR UVEITIS

FOCAL RETINITIS	FOCAL CHOROIDITIS
toxoplasmosis	toxocariasis
onchocerciasis	tuberculosis
cysticercosis	nocardiosis
masquerade syndromes	masquerade syndromes
MULTIFOCAL RETINITIS	**MULTIFOCAL CHOROIDITIS**
Syphilis	histoplasmosis
Herpes simplex	sympathetic ophthalmitis
Cytomegalovirus	VKH syndrome
sarcoidosis	sarcoidosis
masquerade syndromes	serpiginous choroidopathy
candidiasis	birdshot choroidopathy
meningococcus	masquerade syndromes

PANUVEITIS

- Syphilis
- Sarcoidosis
- VKH syndrome
- Infectious endophthalmitis
- Behcet's disease

ACUTE UVEITIS

- Idiopathic
- Ankylosing spondylitis
- Reiter's syndrome
- Fuch's uveitis
- VKH syndrome
- Toxoplasmosis
- White dot syndromes
- Acute retinal necrosis
- Traumatic uveitis

CHRONIC UVEITIS

- juvenile rheumatoid arthritis
- birdshot choroidopathy
- serpiginous choroidopathy
- tuberculous uveitis
- post surgical uveitis
- intraocular lymphoma
- sympathetic ophthalmia
- sarcoidosis
- pars planitis

GRANULOMATOUS UVEITIS

Tuberculosis
Syphilis and other infectious agents
Sarcoidosis
Sympathetic ophthalmia
Lens induced uveitis
VKH Syndrome

AGE RELATED CAUSES OF UVEITIS[19]

AGE (years)	DIAGNOSTIC CONSIDERATIONS
< 5	juvenile rheumatoid arthritis
	toxocariasis
	post viral neuroretinitis
	retinoblastoma
	leukemias
5 – 15	JRA
	Parsplanitis
	Toxocariasis
	Postviral neuroretinitis
	Sarcoidosis
	Leukemia
16 – 25	parsplanitis

	ankylosing spondylitis
	idiopathic anterior uveitis
	toxoplasmosis
	sarcoidosis
	acute retinal necrosis
25 – 45	ankylosing spondylitis
	idiopathic anterior uveitis
	fuch,s uveitis
	idiopathic intermediate uveitis
	toxoplasmosis
	behcet's disease
	sarcoidosis
	white dot syndromes
	VKH syndrome
	AIDS , syphilis
45 – 65	birdshot choroidopathy
	idiopathic anterior uveitis
	idiopathic intermediate uveitis
	idiopathic retinal vasculitis
	behcet's disease

	serpiginous choroidopathy
	acute retinal necrosis
> 65	idiopathic anterior uveitis
	idiopathic intermediate uveitis
	idiopathic retinal vasculitis
	serpiginous choroidopathy
	masquerade syndromes

SYSTEMIC ASSOCIATIONS IN UVEITIS[19]

Symptoms or signs	***Possible associated conditions***
Headache	Sarcoidosis , VKH syndrome
Deafness	Sarcoidosis , VKH syndrome
Vitiligo /poliosis	VKH syndrome
Paresthesia	Multiple sclerosis , Behcet's disease
Alopecia	VKH syndrome
Skin rash	Behcet's , Sarcoidosis , Herpes Zoster , Lyme disease
Skin nodules	Sarcoidosis , Onchocerciasis
Erythema nodusum	Behcet's , Sarcoidosis
Oral ulcers	Behcet's , inflammatory bowel Disease
Genital ulcers	Behcet's , Reiter's disease
Salivary or lacrimal	Sarcoidosis , lymphoma

Gland swelling	
Diarrhea	Whipple's disease , inflammatory bowel disease
Cough , Dyspnea	Tuberculosis , sarcoidosis
Sinusitis	Wegener's granulomatosis
Systemic vasculitis	Behcet's , sarcoidosis
Arthritis	Behcet's , Reiter's , Sarcoidosis , JRA , Rheumatoid arthritis , Lyme disease , inflammatory bowel Disease
Sacroilietis	Ankylosing spondylitis , Reiter's , Inflammatory bowel disease

CLINICAL FEATURES OF UVEITIS
SYMPTOMS

The following are the symptoms of anterior , intermediate and posterior uveitis

ANTERIOR	INTERMEDIATE	POSTERIOR
Pain	floaters	impaired vision
Redness	blurred vision	floaters
Photophobia		metamorphopsia
Dimness of vision		micropsia
Lacrimation		macropsia

SIGNS OF UVEITIS

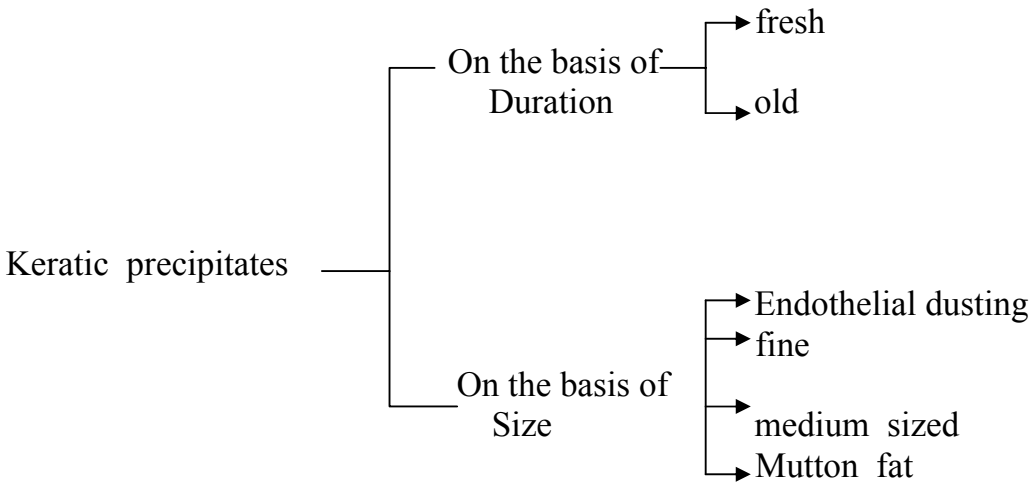
1. Lid and surrounding skin
    - edema
    - vitiligo
    - poliosis → VKH
    - alopecia
    - herpetic lesions
2. lacrimal gland enlargement – as occurs in sarcoidosis
3. conjunctiva
    - circumcorneal congestion
    - sarcoid nodules

- associated scleritis and episcleritis

4. corneal signs :

   - corneal edema - due to toxic endothelitis and increased intraocular pressure if present

   - keratic precipitates – they are conglomerates[19] of inflammatory cells attached to the back of cornea . They are arranged in a triangular fashion (Arlt's triangle) occupying the inferior part of cornea due to convection currents in aqueous humour. In conditions like Fuch's uveitis , KPs are distributed throughout the back of cornea.



→ Fresh KPs – They are rounded , white, fluffy and hydrated in appearance . They imply active uveitis.

→ Old KPs – these are signs of healed uveitis. The KPs with the healing process shrink , fade , become pigmented and has crenated margins

→ Fine and medium sized KPs (granular KPs) – are pathognomonic of non-granulomatous uveitis .They are small, discrete, dirty white KPs arranged irregularly at the back of cornea. They are composed of neutrophils and lymphocytes

→ Mutton-fat KPs – they typically occur in granulomatous uveitis . They are large , thick, fluffy, lardaceous KPs. They are greasy white or waxy in appearance. They are composed of epitheloid cells and plasma cells.

- corneal dendrites - seen in herpetic infections
- interstitial keratitis with uveitis - in cases syphilis
- band keratopathy – in chronic uveitis

5. anterior chamber

- Flare

→ when the slit beam is obliquely aimed across the anterior chamber , the ability to visualize the path of beam is termed Flare.

→ Since the inflammatory cells donot occur in the aqueous , the presence of cells or increased proteins in the anterior chamber is evidence of spillover from the inflamed iris or ciliary body.

→ Increased proteins in the anterior chamber is seen as flare . This is a manifestation of break-down of blood-ocular barrier.

→ There are approximately 7 g of proteins / 100 ml of blood , but only 11 mg / 100 ml of aqueous.

→ Grading of flare[19]

Grade	Schlaegel	Hogan et al
0	-	-
½	faint (normal)	-
1	very slight	very slight
1 ½	mild	-
2	mild – moderate	moderate (iris / lens clear)
3	moderate	marked (iris / lens hazy)
4	severe	intense (fibrin / plastic aqueous)

→ flare and anterior chamber cells are seen with slit lamp set to maximum intensity and magnification

- cells

  → anterior chamber cells are primarily lymphocytes in most cases of uveitis

→ the size of individual cells decrease as the inflammation begins to resolve

→ red blood cells , iris pigment cells and malignant cells may be mistaken for inflammatory cells.

→ Grading of anterior chamber cells[19]

Hogan

Grade	cells / field
0	0
rare cells	1 – 2
occasional cells	3 – 7
1+	7 – 10
1 – 2+	10 – 15
2+	15 – 20
3+	20 – 50
4+	> 50

- depth of anterior chamber

→ irregular - posterior uveitis

→ funnel shaped - iris bombe

→ shallow - peripheral anterior synechiae

6.anterior chamber angle

→ Glaucoma is a frequent complication of uveitis

→ neovascularisation - Fuch's uveitis

→ in patients with uniocular uveitis , the angle should be looked for occult foreign body or ciliary body malignancy

7.Iris

→ muddy iris

→ iris nodules - They are accumulations of inflammatory cells. They are commonly seen in cases of Granulomatous uveitis. They are of two types -

(i) Koeppe nodules – occurs at the pupillary border

(ii) Busacca's nodules - near the collarette of iris

→ synechiae - They are the adhesions between the iris and the lens capsule (posterior synechiae) or the iris and the cornea near the anterior chamber angle (peripheral anterior synechiae)

→ patients with severe chronic inflammation can develop adhesions of the entire posterior iris surface to the anterior lens surface - total posterior synechiae

→ seclusio pupillae - ring synechiae i.e., 360° adhesion of the pupillary margin to the anterior lens capsule , prevents the prevents the flow of aqueous from posterior chamber to anterior chamber leading to 'iris bombe' formation

→ occlusio pupillae - fibrovascular membrane may form in longstanding and recurrent uveitis which remains adherent to the surface of lens and occludes the pupil

→ ectropion uvea

→ heterochromia – Fuch's uveitis

→ rubeosis iridis – occurs in chronic uveitis , Fuch's uveitis

8. pupils

→ miotic

→ Sluggish or non reacting pupil

→ Irregular and festooned pupil

9. lens

→ Pigments over the anterior lens capsule

→ Cataractous changes –

(i) complicated cataract – has polychromatic lustre and bread-crumb appearance

(ii) cataract due to the use of steroids in the treatment of uveitis

POSTERIOR SEGMENT

Posterior segment examination can be done with :

~ Hruby lens

~ Fundus contact lens

~ Three mirror lens

~ +90 D lens

~ Direct ophthalmoscopy

~ Indirect ophthalmoscopy with scleral indentation

10. vitreous

→ fine opacities - Individual inflammatory cells

→ coarse opacities - Result of severe tissue destruction

→ stringy opacities - Due to alteration of the vitreous itself

→ snowball opacities - Sarcoidosis

- Pars planitis

→ Grading of opacities with direct ophthalmoscope[11]

Grade	description
0	Clear vitreous
+	Few , fundus view unimpaired
+ +	Moderate scattered opacities , fundus view somewhat obscured
+ + +	Many opacities , blurring of fundus details
+ + + +	Dense opacities – no fundus view

→ with indirect ophthalmoscopy[11]

grade	Description
+ + + +	Optic nerve head obscured
+ + +	Optic nerve head visible but border blurred
+ +	Better visualization of retinal blood vessels

+	Better definition of optic nerve head and retinal blood vessels
+	Blurring of retinal nerve fiber striations
0	Nerve fiber striations well-defined

11. Fundus lesions

(i) Retinitis

→Retina white , cloudy , indistinct margins

→ Focal retinitis

- Toxoplasmosis
- Cytomegalovirus
- Candidiasis

→Obscured

- Herpes simplex virus

(ii) Choroiditis active lesions

→ Active lesions

- Pale , white , yellow or grayish patches with reasonably well demarcated borders
- No vitreous haze

→ Inactive lesions

- Well defined white patches with reasonably well democrated borders

- Retinal vessels pass over the choroiditis lesions Without interruption

→ Vasculitis - Perivascular cellular cuffing

→ Snow banking - inferior oral region - pars planitis

(iii) Neovascularisation

→ periphery - parsplanitis

→ macular region – histoplasmosis

→ periphery and optic nerve head – sarcoidosis

(iv) macular edema

→ parsplanitis

→ birdshot retinochoroidopathy

→ any chronic uveitis

(v) exudative retinal detachment

→ Harada's disease

→ Sympathetic ophthalmia

→ severe toxoplasmic retinochoroiditis

12. Optic nerve head

→ papillitis - in VKH syndrome , sarcoidosis

→ granuloma

→ edema - due to hypotony

→ optic atrophy - secondary to retinal damage

COMPLICATIONS AND SEQUELAE OF UVEITIS :

- Band keratopathy in cases of chronic uveitis
- Complicated cataract
- Secondary glaucoma - it is caused by -

~ open angle glaucoma is due to the clogging inflammatory cells and plasmoid aqueous in the trabeclar meshwork , trabeculitis and steroid induced.

~ angle closure glaucoma – ring synechiae and iris bombe - occlusio pupillae leading to peripheral anterior synechiae and secondary angle closure

- Cyclitic membrane – due to the fibrosis of exudates present behind the lens
- Retinal complications – cystoid macular edema , exudative retinal detachment and secondary periphlebitis
- Papillitis
- Phthisis bulbi - final end stage of any chronic uveitis

CAUSES OF VISION LOSS IN UVEITIS :

- Corneal edema – occurs in all cases of uveitis as a mild or a severe form
- Aqueous turbidity – if severe, obscures vision
- Induced myopia due to ciliary spasm
- Pupillary block due to exudates
- Complicated cataract[6] – develops in chronic or recurrent cases, due to both the inflammation itself and the corticosteroids used to treat it.
- Cyclitic membrane
- Vitreous haze[6] – permanent vitreous opacification affecting vision occurs in eyes with toxoplasma retinitis and parsplanitis.
- Macular edema – cystoid macular edema is a common cause of visual loss in uveitis
- Papillitis
- Retinal detachment[6] – parsplanitis and posterior uveitis(CMV Retinitis and ARN) cause a rhegmatogenous or tractional detachment
- Secondary glaucoma[6] – Toxoplasma retinitis, ARN, HSV and VZV uveitis usually causes inflammatory OAG. Sarcoidosis , Fuch's uveitis and JRA associated uveitis usually causes secondary angle closure glaucoma

INVESTIGATIONS IN UVEITIS

Reasons to investigate in a case of uveitis are :

- To confirm a clinical diagnosis
- To commence antimetabolite / immunosuppressive therapy
- To identify complications
- To explain the causes of poor vision
- To rule out masquerade syndromes

The following are investigations recommended :

(1) Routine tests

- Hemoglobin , total and differential lymphocyte count , ESR , routine urine analysis

- These are important when the patient is to be started on antimetabolite / immunosuppressive therapy

(2) Immunological tests

- VDRL and FTA-ABS tests to detect syphilis
- rheumatoid factor estimation – done by immunoturbimetry
- anti nuclear antibody (ANA) - detected by immunofluorescence / ELISA - it is positive in some cases of pauciarticular juvenile rheumatoid arthritis with uveitis

- ELISA and PCR (polymerase chain reaction) – done to look for HIV , Toxoplasma , Toxocara , etc.

- Anti – DNA antibody - positive in SLE
- Anti neutrophil cytoplasmic antibody (ANCA) – POSITIVE IN Wegener's granulomatosis and poly arteritis nodosa

- Angiotensin converting enzyme (ACE) – increased in sarcoidosis
- Serum globulins - increased in sarcoidosis
- Serum lysozyme - increased in sarcoidosis and tuberculosis
- Serum C- reactive protein - nonspecific indicator of the inflammatory activity of the body

(3) Radiological tests

- chest x-ray – tuberculosis and sarcoidosis
- skull x-ray – to rule out congenital toxoplasmosis
- sacroiliac and spinal x- ray - ankylosing spondylitis
- gallium scan - done in sarcoidosis

(4) HLA typing

- HLA antigens are now considered to be the genetic markers for disease susceptibility
- As it is an expensive test , it is reserved for those patients in whom it would make a therapeutic or prognostic difference
- The following diseases are associated with HLA antigens :
    - ~ Behcet's disease – HLA B-5
    - ~ Birdshot choroidopathy - HLA A-29
    - ~ Sympathetic ophthalmia - HLA A-11
    - ~ VKH syndrome - MT-3/HLA BW22J

(5) Skin tests

The basis for all skin tests is delayed hypersensitivity reaction of type IV . Many skin tests are available . Its main use has been the diagnosis of tuberculosis and histoplasmosis .

- Mantoux test : Tuberculosis
- Histoplasmin test : Histoplamosis
- Kveim test : Sarcoidosis
- Anergy : Sarcoidosis / Leprosy

(6) Ultrasonography

As such it doesnot help in diagnosing uveitis , but helpful to diagnose a masquerading anterior uveitis with hazy media.

- It can rule out long standing retinal detachment , any intraocular tumour or coats disease .

- It can help in planning surgery in patients with hazy media or complicated cataract due to uveitis.

- Helpful in diagnosing Sympathetic ophthalmia by analyzing the retinochoroidal thickening

(7) Fundus fluorescein angiography

- anterior segment angiography has little role except to detect or prove suspected iris neovascularization
- it not only helps in diagnosing certain conditions like birdshot retnochoroidopathy , VKH syndrome or macular edema but also helps to regulate treatment and detection of sequelae or complications
- Any case of anterior uveitis or intermediate uveitis with unexplained loss of vision must be investigated by fluorescein angiography to rule out cystoid macular edema
- It helps in the detection of sub-retinal neovascularization so that it can be managed early

(8) Diagnostic surgical procedures

- surgical procedures are frequently the only method of distinguishing a disease of presumed auto-immune etiology from an infectious or malignant ocular process , since the clinical appearance may not always be diagnostic

- There are different invasive procedures , each with its own merit and disadvantages . They include :

  - Paracentesis - Anterior chamber paracentesis provides a small amount of fluid , that can be used for immuno-histology , cytology , antibody estimation and for culture , depending upon the merit of the case

  - Vitreous aspiration - It provides undiluted specimen that can be sent for culture and a portion of it is processed for cytology or antibodies

  - Vitrectomy - If time and technical skills are available vitrectomy is preferred method as compared to aspiration due to the following factors : collection of more material , better follow-up due to clear media , less complications due to controlled traction on vitreous base or avoidance of traction and because chorioretinal biopsy can also be taken

  - Chorioretinal biopsy - It is a highly invasive procedure and is only considered when all other invasive diagnostic techniques like vitreous biopsy has failed to provide useful information and the patient is going downhill inspite of the best treatment . The biopsy specimen can be divided for culture , histology and immunopathology

TREATMENT OF UVEITIS

MEDICAL TREATMENT

Treatment of uveitis can be undertaken in a rational manner only by first categorizing the nature of uveitis and then defining the treatment objectives.

The objectives of treatment

- to preserve macular acuity
- to preserve visual fields
- to provide symptomatic relief
- to prevent complications

In general , anterior uveitis may be managed in most cases by topical medication ; intermediate uveitis by periocular injections , posterior uveitis by specific or non-specific systemic medications and panuveitis by a combination of the above routes of drug administration . Also , greater the threat to vision , more intense and more rapid must be the treatment initiated .

Parameters commonly employed to assess treatment response are improvement / stabilization of visual acuity , improvement of media clarity and decrease in cellular activity , decrease in symptoms , stabilization or regression of lesion (e.g. tubercle) or exudative detachment.

Steroid Resistant(non-response) :

No clinical improvement or worsening despite 2 weeks of treatment with maximum dose of oral corticosteroids . Also called steroid non-responsiveness.

Immunosuppressive Resistant : No clinical improvement despite a trial of atleast 3 months.

(i) Non – specific treatment

1. Mydriatic – cyclopleigic drugs :

Spasm of the ciliary muscle is thought to play an important role in the genesis of these symptoms. Hence, an important and necessary intervention in patients with uveitis (mainly anterior uveitis) is to ameliorate these symptoms by the use of not only anti-inflammatory agents but also cycloplegics . Commonly used drug is Atropine sulphate 1% eye oinment . In case of atropine allergy , other cycloplegics like 2% Homatropine or 1% cyclopentolate eyedrops may be instilled 3-4 times per day . For more powerful cycloplegic effect , a subconjunctival injection of 0.25 ml mydricaine (a mixture of atropine , adrenaline , procaine) should be given. The cycloplegics should be continued for at least 2 – 3 weeks after the eyes become quiet ,otherwise relapse may occur .

2. Corticosteroid Therapy

Corticosteroids are the drugs of choice in all forms of uveal inflammation not caused by an organismal colonization . Though these drugs are effective in ameliorating the inflammation in a large majority of patients , they have the potential for production of significant ocular and systemtic morbidity . Hence caution is recommended in their use .

For the management of uveal disorders corticosteroids have been administered by three routes : systemic (oral and parenteral) , peri - ocular (subconjunctival and subtenon) and topical (drops and ointments) .

The usual frequency of using topical steroids is every 1 – 2 hourly in acute cases and 6 hourly to once daily for maintenance in chronic cases . Topical steroids once commenced must be tapered only gradually as otherwise there could be a flare up in disease activity . For maintenance the therapy should be individualized by trial and error . The end point is normally less than 1+ cells and flare .

Periocular delivery of corticosteroids by injections is indicated whenever the response to topical therapy is less than anticipated , patient compliance for frequent administration cannot be assured , and in intermediate and posterior uveitis .

The various routes of periocular injections are subconjunctival , anterior subtenon , posterior subtenon , combined anterior and posterior subtenon and peribulbar. For intermediate uveitis the most widely recommended route is posterior subtenon injection . The usual dose delivered is 0.5- 1.0 ml. In patients with intermediate uveitis , injection of depot corticosteroids into the posterior subtenon space has been found effective .

Systemic administration of corticosteroids is recommended in the following situations :

- Bilateral intermediate uveitis
- Unilateral intermediate uveitis not responding to posterior subtenon injections

- Posterior uveitis and panuveitis with

  ~ severe inflammation

  ~ associated exudative detachment

  ~ rapid loss of vision

  ~ lesion threatening the macula , papillomacular bundle or the optic nerve

3. Immunosuppresive therapy

In the pathogenesis of several uveitic entities , immunological mechanisms play a significant role. Hence , the drugs that have an ability to suppress the immune drive would also decrease the tissue damage resulting from the inflammatory mediators .

The objectives of immunosuppressive treatment in uveitis are:

~ to decrease the inflammation when there is steroid resistance , high steroid dependence or steroid induced complications

~ Help the patients to maintain atleast ambulatory vision.

Pre-requisites before commencing immunosuppressive therapy inorder to decrease the systemic risks and achieve the treatment objectives :

~ The uveitis must be bilateral with best corrected visual acuity below 6 / 12 in the better eye

~ There must be steroid resistance , high steroid dependence or steroid complications

~ Non-infectious or non-neoplastic etiology

~ No systemic contraindications

~ Patient must be compliant and provide an informed consent

~ There must be availability of laboratory monitoring

These drugs are mainly useful in Bencet's disease, Sympathetic ophthalmia , Pars planitis and VKH syndrome .

A few available immunosuppressive drugs include Azathioprine , Cyclosporine , Cyclophosphamide , Chlorambucil and Methotrexate .

Some newer immunosuppressive drugs include – Tacrolimus and Monoclonal antibodies.

5. Physical measures :

~ Hot fomentation - it is very soothing , diminishes pain and increases circulation , and thus reduces venous stasis . As a result more antibodies are brought and toxins are drained. It can be done by dry heat or wet heat.

~ Dark goggles - it gives a feeling of comfort , especially when used in sunlight , by reducing photophobia , lacrimation and blepharospasm .

6. Treatment of endophthalmitis

It includes all the above said measures along with –

~ Antibiotics - administered topically , subconjunctivally , intravitreally and systemically . Antibiotics are selected according to the culture and sensitivity report of vitreous aspirated fluid .

~ Vitrectomy surgery is performed if the patient does not improve with the above intensive therapy for 48-72 hours.

7. Treatment of Panophthalmitis

~ anti-inflammatory drugs and analgesics to relieve pain

~ Broad spectrum antibiotics

~ Evisceration operation should be performed to avoid the risk of intracranial extension.

(ii) Specific treatment of the cause

The non-specific treatment described above is very effective and usually eats away the uveal inflammation , but it does not cure the disease process , resulting in relapses. Therefore all possible efforts should be made to find out and treat the underlying cause . so a full course of anti-tubercular drugs for underlying Koch's disease , adequate treatment of syphilis , toxoplasmosis , etc when detected should be carried out.

(iii) Treatment of complications

~ inflammatory glaucoma – in such cases , drugs to lower intraocular pressure should be added

~ complicated cataract – requires lens extraction under steroid cover, with guarded prognosis inspite of all precautions

~ retinal detachment - of exudative type usually resolves by itself if uveitis is treated aggressively . A Tractional detachment requires vitrectomy and management of complicated retinal detachment

~ phthisis bulbi especially when painful , requires removal by ennucleation surgery.

AIMS OF THE STUDY

1. To study the clinical patterns of uveitis in the patients referred to a tertiary care hospital
2. To evaluate the complications associated with uveitis
3. To investigate the degree, duration and causes of visual loss in these patients and to compare the same with other studies

MATERIALS AND METHODS

A randomized prospective study was performed on consecutive uveitis patients referred to the Uvea clinic, Department of Ophthalmology, Government Rajaji Hospital, Madurai. The study was started in the month of September 2004 and 100 patients were selected and followed up for a period of 2 years.

Inclusion Criteria :

The patients included in this study had

- Age > 15 years
- Uveitis new case

Exclusion Criteria :

The following patients are excluded from the study

- Age < 15 years
- Intraocular inflammation secondary to bacterial / fungal keratitis
- Onset of uveitis was < 3 months of intraocular surgery
- Patients treated outside with periocular, Systemic steroids / Immuno suppressives
- Patients having speech / hearing problems

- Patients unable / unwilling to come for follow up

The questionnaire included

1. Age
2. Sex
3. Address
4. Laterality
5. Presenting complaints in details – onset, severity, etc
6. Leading questions regarding various etiological factors
    a. Tuberculosis – family history
    b. HLA – B27 related uveitis
    c. Leptospirosis
    d. Pet (Toxoplasmosis / Toxocariasis)
    e. Leprosy
    f. Cytomegalovirus
    g. Infective foci elsewhere in the body
    h. Symptoms related to genito-urinary system, gastro intestinal system, CNS, respiratory system and skin diseases.
7. Past history of Trauma, eye inflammation, prior similar episodes, prior visual loss.
8. Treatment history
9. Ocular examination – included
    a. Best corrected visual acuity

b. Intraocular pressure at presentation

c. Detailed slit lamp examination (Either eye)

i. Lids – vitiligo, alopecia, herpetic lesions

ii. Conjunctiva & sclera – Sarcoid nodules, scleritis, episcleritis, circumciliary congestion

iii. Cornea - superficial lesions
- deep stromal lesions
- Band keratopathy
- Ulceration (dendritic)
- interstitial keratitis (Disciform keratitis)
- Corneal edema, scarring
- Keratic precipitates - Size, appearance & distribution

iv. Anterior chamber
- Flare
- Cells and their grading
- Depth

v. Iris
- Muddy iris
- Koeppe's and Bussaca nodules
- Atrophy
- Heterochromia

- Synechiae
- Ectropion uvea
- Rubeosis

vi. Pupils - Size, shape and reaction

vii. Lens - Pigments on anterior capsule
- Cataractous changes

d) Posterior segment examination

The posterior segment is examined with direct, indirect and three mirror contact lens.

i) Vitreous - Opacities
- Hemorrhage
- Snow banking

ii) Retina - Retinitis, choroiditis
& choroid - Vasculitis
- Macular edema
- Retinal detachment

iii)Optic nerve head - Papillitis
- optic disc edema from hypotony
- optic atrophy – secondary to retinal damage

e) Detailed Systemic examination – done by a physician to R/o any associated systemic diseases

Subsequently a tailored laboratory investigations was carried out. The investigations included.

1. Total leucocyte count
2. Differential count

3. Erythrocyte sedimentation rate
4. Mantoux test
5. VDRL
6. ELISA for HIV I & II
7. Rheumatoid factor
8. Ig M assay for leptospirosis
9. Fundus fluorescein angiography
10. X – ray chest / sacroiliac spine
11. Ultrasound B – Scan

The final aetiological diagnosis was based on the clinical features, relevant investigations and systemic evaluation.

HLA B 27 related uveitis was diagnosed mostly on the basis of clinical presentation with features of low back ache, history of significant joint pain i.e., joint pain involving larger joints lasting for a period of time, hypopyon uveitis with multiple posterior synechiae and the other eye showing evidence of old uveitis and those who were diagnosed as HLA B 27 patients by the physician.

Endogenous endophthalmitis was diagnosed mostly on the acute presentation with hypopyon, USG evidence of vitreous exudates and culture positivity.

Patients were identified as having permanent ocular damage if they had irreversible changes, such as macular scarring or atrophy, lamellar macular hole, optic atrophy and so on.

For the purpose of study, visual loss was defined as best corrected vision of worser than 6/18 patients. The visual morbidity was subdivided into two groups.

- Moderate visual loss – defined as visual acuity of 6/18 to 6 / 60
- Severe visual reduction – visual acuity of < 3/60

The patients were followed up for a period of 2 years. Best corrected visual acuity, Intraocular pressure measurements and slit-lamp examination was done at each visit.

To determine the visual loss, the final visual acuity was used and not the worst visual acuity at any visit. As the level of vision in uveitis may fluctuate with varying severity or sequelae of inflammation the total duration of visual loss was calculated by adding the duration of individual episodes.

REVIEW OF LITERATURE

1. **Durrani OM, Tehrani NN, Mar JE, et al [5]. Br J Ophthalmol 2004 ; 88** : 1159 – 1162 ***Degree, duration and causes of visual loss in uveitis***

The retrospective, non-interventional observational survey was conducted with 315 consecutive patients attending a tertiary referral uveitis service. The mean duration of follow up was 36.7 months. Reduced vision (less than or equal to 20/60) was found in 220 of 315 patients (69.95%) with a subset of 120 patients having vision less than or equal to 20/200 unilateral visual loss occurred in 109 patients (49.54%) while 111 patients (50.45%) had bilateral visual loss. The mean duration of visual was loss was 21 months. Of the 148 patients with panuveitis, 125 (84.5%) had reduced vision, with 66(53%) having vision < 20/200. Main causes of visual loss was cystoid macular edema (CMO) in 59 of 220 patients (26.8%), cataract in 39 patients (17.7%), and a combination of CMO and cataract in 44 patients (20%). The following were predictors of a poorer visual prognosis - panuveitis, bilateral inflammation, increasing duration, Indian or Pakistani ethnic background and increasing patient age.

Researchers concluded that prolonged visual loss occurred in two-thirds of uveitis patients in the study. CMO and cataracts were responsible for visual loss in 64.5% of patients.

2. **Rothova A [25], Suttorp – VanSchulten MS, Frits Treffers W, Kijlstra A. Br J Ophthalmol 1996 Apr 80 (4) : 332-6**

Causes and frequency of blindness in patients with intraocular inflammatory diseases.

A cross sectional and retrospective study of 582 patients, 203 (35%) exhibited blindness or visual impairment, bilateral legal blindness developed in 22 (4%) patients, 26 (4.5%) had one blind eye with visual impairment of the other and nine (1.5%) had bilateral visual impairment. Unilateral blindness developed in 82 (14%) patients, whereas 64 (11%) exhibited unilateral visual impairment. The most important causes of both blindness and visual impairment was cystoid macular edema (29% and 41% respectively). Complications of uveitis were encountered in more than half of the patients and 23% underwent one or more surgical procedures. Patients with panuveitis had worst visual prognosis.

3. **Jesus Merayo[8] – Lloves, William J. Power, et al. Ophthalmologica 1999 ; 213 : 300 -304.** ***Secondary glaucoma in patients with uveitis***

The hospital records of patients with uveitis referred to immunology service of the Massachusetts Eye and Ear infirmary for a decade were reviewed for cases of secondary glaucoma (SG).

1,254 patients (9.6%) with uveitis developed SG. SG was more frequent in anterior uveitis (67%). But was also associated with posterior

uveitis (13%) and pars planitis (4%). Herpetic kerato uveitis (22%), Fuch's iridocyclitis (19%), Juvenile Rheumatoid arthritis – associated iridocyclitis (16%), Syphilis (14%) and sarcoidosis (12%) were the leading types of uveitis associated with SG. Despite aggressive medical and surgical therapy, SG was associated with progressive visual field loss and optic nerve head damage in 39 patients (33%). So SG is an under appreciated vision threatening complication in patients with uveitis.

4. **Gritz DC, Wong IG. Ophthalmology 2004, Mar ; 111 (B) : 491-500,** ***Incidence & prevalence of uveitis in Northern California ; the Northern California Epidemiology of uveitis study.***

The patient database of a large health maintenance organization was searched for all patients who, during a 12 month period, had the potential diagnosis of uveitis.

At mid study, the population for the six communities were the 731898. During the target period, 382 new cases of uveitis were diagnosed ; 462 cases of uveitis were diagnosed before the target period. These data yielded on incidence of 52.4 / 100000 person – years and a period prevalence of 115.3 / 100000 persons. The incidence and prevalence of disease were lowest in paediatric age groups and were highest in patients 65 years or older. ($p<0.0001$). the prevalence of uveitis was higher in women than in men ($p< 0.001$), but the difference in incidence between men and women was not

satisfactory significant. The study also showed that women had higher prevalence of uveitis than men, and the largest differences were in old age groups.

5. **Guex - Crosier Y**

Rev Prat 1999 Nov 15 ; 49 (18) : 1989 – 94

Epidemiology of Uveitis

According to this study, the incidence of uveitis varies from 14-28 / 100,000 habitants. According to anatomical classification, about 30-60% (average 47%) are related to anterior uveitis, 6-30% (average 21%) are posterior uveitis, 7-15% (average 12%) are intermediate uveitis and 7-69 % (average 20%) are panuveitis. A specific diagnosis was established in more than 70% in most series. The most frequently diagnosed entities are HLA B-27 related uveitis, acute anterior uveitis in herpes zoster disease, Toxoplasmosis, sarcoidosis and pars planitis.

RESULTS AND COMPARATIVE ANALYSIS

A prospective study involving 100 cases of uveitis presenting at the eye department of Govt. Rajaji Hospital was done and the following results obtained.

Table – 1: **Gender Distribution**

Gender	Number	%
Male	60	60%
Female	40	40%
Total	100	100%

Table – 2: **Course of Diseases**

Course	Number	%
Acute	60	60%
Chronic	40	40%
Total	100	100%

Table – 3: **Age Distribution**

Age Group (yrs)	Number	%
15 – 30	36	36%
31 – 50	42	42%
51 – 70	18	18%
70+	4	4%
Total	100	100%

In this study, 36 cases were in 15-30 yrs age group, 42 cases (42%) were in 31-50 years age group, 18 cases (18%) were in 51-70 years age group and 4 patients were in 71+ age group. Most cases of uveitis were in 31-50 years age group. This is in accordance with the study of Rothava et al[25].

Table – 4: **Laterality**

Laterality	Number	%
Unilateral	41	41%
Bilateral	59	59%
Total	100	100%

41 cases were unilateral and remaining 59 cases were bilateral. Both eyes are equally affected. There is no right – left preponderance of occurrence of uveitis.

Table – 5: **Aetiology of Uveitis**

Aetiology	Number	%
Idiopathic	40	40%
HLA –B27 uveitis	6	6%
Tuberculosis	10	10%
Leptospirosis	6	6%
Traumatic anterior uveitis	6	6%
Sarcoidosis	3	3%
Fuch's	5	5%
Parsplanitis	3	3%
Acute retinal necrosis (ARN)	3	3%
Posner scholsmann syndrome	1	1%
Endogenous Endophthalmitis	2	2%
CMV retinitis	4	4%
Toxoplasmosis	3	3%
Behcet's	1	1%
VKH	1	1%
Sclero Keratouveitis	2	2%
Viral kerato uveitis	1	1%
Lens induced uveitis	2	2%
Hansen's disease	1	1%
Total	100	100%

The most common cause of uveitis in this study was idiopathic (40%), followed by tuberculosis (10%). The other cases were HLA B-27 associated uveitis 6 cases (6%), Leptospirosis 6 cases (6%),Traumatic anterior uveitis 6 cases (6%), Sarcoidosis 3 cases (3%), Fuch's heterochromic uveitis 5 cases (5%), Parsplanitis 3 cases (3%), Acute Retinal necrosis 3 cases (3%) , Posner scholssman syndrome 1 case (1%), Endogenous endophthalmitis 2 cases (2%), CMV retinitis 4 cases (4%), Toxoplasmosis 3 cases (3%), Behcet's disease 1 case (1%), Vogt Koyanagi Harada's syndrome 1 case (1%), Sclerokerato uveitis 2 cases (2%), viral kerato uveitis 1 case (1%), Lens induced uveitis 2 cases (2%) and Hansen's disease 1 case (1%).

Table – 6: **Anatomic Location of Uveitis**

Location	Number	%
Anterior	60	60%
Intermediate	10	10%
Posterior	14	14%
Panuveitis	16	16%
Total	100	100

In this study, 60 cases (60%) presented with anterior uveitis, out of this 60 cases, 36 cases were males and rest 24 were females. 10 cases presented as intermediate uveitis, with 6 cases as males and 4 cases as females. Pan uveitis occurred in 16 cases, where 10 were in males and 6 in females. 14 cases presented with posterior uveitis where 8 were in males and 6 in females. Anterior uveitis is the most common presentation and this is in accordance with the other studies[25].

Table – 7**: Course Vs Anatomic Location of uveitis**

	Acute	Chronic	Total
Anterior	53	7	60
Intermediate	1	9	10
Posterior	2	12	14
Pan Uveitis	4	12	16
Total	60	40	100

Table – 8: **Glaucoma in Uveitis**

Uveitis	No.of patients	Percentage
Anterior	4	80
Panuveitis	1	20
Total	5	100

Of the 100 patients of uveitis, 5 patients developed glaucoma. It occured in 4 patients of anterior uveitis (80%) and 1 patient (20%) of pan uveitis. SG is common in anterior uveitis and is in accordance with Jesus Merayo et al study[8].

Table – 9: **Complications of Uveitis** :

Complication	Number	%
CME	7	16.27
Cataract	7	16.27
CME & Cataract	6	13.95
Macular scar	3	6.97
Macular degeneration	2	4.65
Glaucoma	5	11.62
RD	3	11.62
Vitritis	6	13.95
Optic neuropathy	2	4.65
Optic disc edema	1	2.3
Choroidal detachment	1	2.3
Total	43	100

Out of the 100 cases of uveitis, 43 patients developed complications. Cystoid macular edema (CME) occurred in 7 cases which forms 16.27 % of complications of uveitis followed next by cataract 7 cases (16.27%) and combination of CME and cataract in 6 cases (13.95%). The other complications were macular scar in 3 cases (6.97%), Macular degeneration in 2 cases (4.65%), glaucoma in 5 cases (11.62%), Retinal detachment (RD) in 3 cases (6.97%),Vitritis in 6 cases (13.95%), Optic neuropathy in 2 cases (4.65%), Optic disc edema in 1 patient (2.3%) and Choroidal detachment in 1 case (2.3%).

Table – 10: **Causes of Visual Loss** :

Causes	Number	%
CME	7	17.07
Cataract	6	14.63
CME & Cataract	6	14.63
Macular pathology	5	12.19
Glaucoma	2	4.87
RD	3	7.3
Choroidal detachment	1	2.43
Vitritis	5	12.19
Multiple	4	9.76
Optic disc involvement	2	4.88
Total	41	100 %

In this study, the patients with visual acuity of < 6/18 were taken to have visual loss. Visual loss occurred in 41 out of 100 patients of uveitis. Cystoid macular edema was the common cause of visual loss in this study. It occurred in 7 patients (17.07%). It is followed by cataract in 6 cases (14.63%). The other causes were macular pathology(other than CME), including macular scar, & macular degeneration occurred in 5 patients (12.19%), glaucoma in 2 patients (4.87%), Retinal detachment in 3 cases (7.3%), vitritis in 5 cases (12.19%), optic disc involvement (neuropathy / atrophy) in 2 cases (4.88%), and choroidal detachment in 1 case (2.43%). In 4 cases (9.76%) multiple factors were involved in causing the visual loss. No specific cause could be ascertained.

Table – 11: **Causes Vs Degree of visual loss**

Causes	< 3/60	≥6/60 - 6/18	%
CME	1	6	7
Cataract	0	6	6
CME & Cataract	0	6	6
Macular pathology	1	4	5
Glaucoma	1	1	2
RD	1	2	3
Choroidal detachment	0	1	1
Vitritis	0	5	5
Multiple	0	4	4
Optic disc pathology	2	0	2
Total	6	35	41

In this study, CME was the common cause of visual loss and it leads to severe visual loss in 1 case (14.3%) with moderate visual loss in rest of 6 cases (85.7%). Cataract leads to moderate visual loss. No case of it leading to severe visual loss had occurred. The other causes of severe visual loss include macular pathology 1 case (20%), glaucoma in 1 case (50%), and optic disc pathology in 2 cases (100%) and Retinal detachment (33.3%). The other causes of moderate visual loss include – combination of CME and cataract 6 cases (100%), macular pathology 4 cases (80%), glaucoma 1 case (50%), Retinal detachment 2 cases (67.5%), vitritis 5 cases (100%), choroidal detachment 1 case (100%) and multiple factors in 4 cases

(100%). Durrani[5] and Rothava[25] et al study found CME to be the commonest cause of visual loss as in the present series.

Table – 12: **Causes of Visual loss vs Anatomic Location**

Causes	Anterior	Inter mediate	Pan uveitis	Posterior	Total
CME	1	1	3	2	7
Cataract	2	1	2	1	6
CME & Cataract	1	1	2	2	6
Macular pathology	0	1	2	2	5
Glaucoma	1	0	1	0	2
RD	0	0	1	2	3
Choroidal detachment	0	1	0	0	1
Vitritis	0	2	1	2	5
Multiple	3	0	1	0	4
Optic disc involvement	0	0	1	1	2
Nil	52	3	2	2	59
Total	60	10	16	14	100

In this study, CME commonly occurred in pan uveitis – 3 cases (42.9%) followed by posterior uveitis – 2 cases (28.6%), anterior uveitis 1 case (14.3%) and intermediate uveitis – 1 case (14.3%).

Table – 13: **Visual loss Vs Gender distribution**

Visual loss	Male	Female	Total
< 3/60	4 (66.7%)	2 (33.3%)	6 (100%)
≥ 6/60 – 6/18	21 (60%)	14 (40%)	35 (100%)
Total	25 (60%)	16 (40%)	41 (100 %)

The visual loss was common in males – 25 cases (60%) when compared to females – 16 cases (40%) and this is confirmed by other studies. Severe visual loss occurred in 4 male patients (66.7%) and 2 female patients (33.3%). Moderate visual loss (≥ 6/60-6/18) occurred in 21 male patients (60%) and 14 females (40%).

Table – 14: **Aetiology Vs Degree of visual loss**

Aetiology	< 3/60	≥ 6/60-6/18	Total
Idiopathic	0	10	40
Tuberculosis	0	8	10
Leptospirosis	0	1	6
Traumatic uveitis	1	0	6
Sarcoidosis	0	3	3
Fuch's uveitis	0	1	5
Parsplanitis	0	3	3
ARN	1	2	3
Endogenous endophthalmitis	0	2	2
CMV Retinitis	1	2	4
Toxoplasmosis	1	2	3
Behect's disease	1	0	1
VKH syndrome	0	1	1
Hansen's disease	1	0	1
Total	6	35	41

In this study, 6 cases of severe visual loss occurred in 1 case of traumatic anterior uveitis (16.6%), 1 case of acute retinal necrosis (33.33%), 1 case of CMV retinitis (25%), one case of Toxoplasmosis (33.33%), 1 case of Behect's disease (100%), and in one case of Hansen's disease (100%). The moderate visual loss occurred in 10 case of idiopathic uveitis (25%) 8 cases of tuberculous uveitis (80%), 1 case of leptospirosis (16.6%), 3 cases of sarcoid uveitis (100%), 1 case of Fuch's uveitis (20%), 3 cases of

parsplanitis (100%), 2 cases of acutue retinal necrosis (66.7%), 2 cases of endogenous endophthalmitis (100%), 2 cases of CMV retinitis (50%), 2 cases of Toxoplasmosis (66.71%) and 1 case of vogt Koyangai Harada's disease (100%).

Table – 15**: Visual Loss Vs Laterality**

Visual Loss	Unilateral	Bilateral	Total
< 3/60	1 (16.7%)	5 (83.3%)	6 (100%)
≥ 6/60 – 6/18	14 (40%)	21 (60%)	35 (100%)
Total	15 (36.6%)	26 (63.4%)	41 (100%)

In the five patients (83.3%) with severe, bilateral visual loss, 3 patients had visual acuity of < 3/60 in both eyes, the rest of 2 patients had < 3/60 visual acuity in one eye and ≥ 6/60 – 6/18 visual acuity in the other eye. One patient (16.7%) had severe unilateral visual loss. 14 patients (40%) had moderate visual loss in one eye, while the rest 21 patients developed bilateral moderate visual loss. So 15 patients (36.6%) had unilateral loss of vision, while 26 patients (63.4%) had bilateral loss of vision.

Table – 16: **Visual loss Vs Course of disease**

Course	Visual loss(<6/18)	Total
Acute	10 (16.6%)	60 (100%)
Chronic	31 (77.5%)	40 (100%)
Total	41	100

10 patients (16.6%) of acute uveitis developed visual loss, while 31 patients (77.5%) of chronic uveitis had visual loss.

Table – 17: **Mean Duration of visual loss**

Visual loss	Mean Duration (mon)
Severe	24
Moderate	17.25

The mean duration of patients with severe visual loss was 24 months, as the visual loss persisted till the end of the study duration. The mean duration of moderate visual loss was 17.25 months.

SUMMARY

- In this study, uveitis commonly occurred in males (60% of cases)
- 60% of uveitis had acute course, while 40% had chronic course. i.e., Acute uveitis is commonest in this study.
- Most of the patients, 42% were in the age group of 31-50 yrs who are economically productive to the society and have a socioeconomic impact. In this age group idiopathic (40.47%) was the common cause followed by Tuberculosis 5 cases (11.9%) and HLA B 27 uveitis 4 cases (9.53%).
- 59% of patients had bilateral inflammation
- In 40% cases, the cause could not be identified and hence, certified as idiopathic. It is the commonest cause of uveitis followed by Tuberculosis in 10% cases.
- 60% cases had anterior uveitis followed by panuveitis in 16% cases, posterior uveitis in 14% cases and intermediate uveitis in 10% cases.
- Most common complication of uveitis in this study are Cystoid macular edema (16.27%) and cataract (16.27%).

- ❖ Secondary glaucoma is common in anterior uveitis (80%)
- ❖ Most common causes of visual loss was cystoid macular edema (17.07%) followed by cataract (14.63%) and a combination of cataract and CME in 14.63 % cases.
- ❖ CME, macular pathology, glaucoma, retinal detachment and optic disc involvement were the causes of severe visual loss. The common causes of moderate visual loss are CME, cataract, combination of cataract and CME and multiple factors.
- ❖ CME commonly occurs in panuveitis (42.9%) and posterior uveitis (28.6%). Cataract commonly occurs in anterior (33.3%) and pan uveitis (33.3%). The combination of CME & cataract occurs commonly in panuveitis (33.3%) and posterior uveitis (33.3%).
- ❖ Visual loss commonly occurs in panuveitis (87.5%) followed by posterior uveitis (85.71%), intermediate uveitis (70%) and anterior uveitis (13.3%). So it can be concluded that visual prognosis was better in anterior uveitis and a guarded prognosis has to be given in pan uveitis and posterior uveitis
- ❖ Visual loss commonly occurs in male patients (60%)

The diseases associated with severe visual loss were Traumatic anterior uveitis(CME), ARN(optic neuropathy) , CMV retinitis(retinal detachment) ,Toxoplasmosis(macular scar), Behect's disease(optic atrophy) and Hansen's disease(glaucomatous optic atrophy)

- ❖ Bilateral visual loss (63.4%) was common in this study.
- ❖ 3 patients developed blindness as per WHO definition
- ❖ Visual loss was common in cases of chronic intraocular inflammation (77.5%).
- ❖ Permanent visual damage leading to severe visual loss occurred in 6 patients leading to the mean duration of 24 months of visual loss. The mean duration of visual loss in cases with moderate visual loss was 17.25 moths.

DISCUSSION

This study provides information about the uveitis pattern in a tertiary referral eye centre, causes of visual loss and duration of it. However there may be limitations due to its short duration and referral bias of cases in a tertiary hospital.

This study was compared to OM Durrani, Tehrani et al[5] study and Aniki Rothova et al[25] study.

Anterior uveitis was the most common presentation which is in agreement with the studies by Rothova et al[25] (42%).

Secondary glaucoma is most common in anterior uveitis and is in accordance with Jesus Merayo et al[8] study.

In this study, 41% had visual loss which is comparable to Rothova et al[25] study (35%). In Durrani et al[5] study the visual loss occurred in 69.97%. but they have included the patients with visual acuity of 6/18 in the category for defining visual loss whereas in this study, patients with visual acuity of < 6/18 were categorized under visual loss.

Panuveitis (87.5%) had worst prognosis in this study as that of Rothova et al[25] and Durrani et al[5] study (84.5%)

CME was the most common cause (17.07%) of visual loss in this study, comparable to Rothova et al[25] study (26%) and Durrani et al[5] study (26.8%).

Main Causes of visual loss :

	Present Series	Durrani study
CME	17.07 %	26.8%
Cataract	14.63 %	17.7 %
Combination	14.63%	20%

The difference between these 2 studies could be due to large number of patients longer duration of follow-up. Bilateral visual loss is common in this series comparable to Durrani et al[5] study.

The commonest systemic disorder associated with visual loss in uveitis was due to sarcoidosis as per Rothava[25] study whereas in the present study the commonest systemic disorder associated with visual loss was tuberculosis.

- ❖ Bilateral legal blindness as per Rothava's[25] study was 4% and in this study was 3%.
- ❖ Behcet's uveitis leads to unilateral blindness as per Rothava's[25] study and comparable to this study.
- ❖ Mean duration of vision loss in uveitis was 24 months for severe visual loss and 17.25 months for moderate visual loss. According to Durrani et al[5] study, it was 22.8 months for patients with severe visual loss and 20.35 months for patients with moderate visual loss.

CONCLUSION

Visual loss is common in patients with uveitis. This prospective study was basically a descriptive study analyzing 100 cases of uveitis that presented to the eye department of Govt. Rajaji Hospital.

In out study, the commonest cause of uveitis was idiopathic followed by tuberculosis. There was a male preponderance. This may be due to the fact that males tend to seek more medical care, as they are wage earners in a developing country.

Acute uveitis was the common presentation. Anterior uveitis was commoner. Majority of the patients were in the economically productive age group of 31-50 years. So visual loss made socio economic impact on the community.

The common complications of uveitis were cystoid macular edema, cataract and a combination of these both. The most common cause of visual loss in uveitis patients were cystoid macular edema.

Male patients with uveitis had a higher risk of visual loss. Pan uveitis had the worst prognosis of vision. Bilateral chronic visual loss usually result in significant permanent visual damage.

The results were comparable with other studies.

- Uveitis is one of the major causes of visual loss in working population
- The patients should be insisted on regular follow up and educated about the warning symptoms of complications
- A routine and periodic ophthalmic screening is necessary in all the systemic disorders found associated with uveitis
- The patients who have been adequately treated should also be educated about the possibility of recurrence and advised to come for follow up if any symptoms recur.
- With more specific and sophisticated investigations and treatment modalities, the sight threatening complications and the resulting effect on socio economic performance of the working population can be handled more efficiently.

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PROFORMA

Name : Date : Laterality RE

Age : OP No: LE

Sex : Case No: BE

Occupation:

Social Status:

History :

	Right eye (Duration)	Left eye (Duration)
Pain		
Redness		
Photophobia		
Defective vision		
Floaters		

HLA – B 27

- Low Backache
- Joint pain
- Fever
- Skin lesions

BEHCET's

- Recurrent oral ulcer
- Skin lesions

Recurrent genital ulcers

Recurrent ocular inflammation

Recurrent arthritis

- H/o Contact with pet animals
- Family H/o Tuberculosis / Leprosy
- Infective foci (endogenous endophthalmitis)

Caries tooth

Non – healing ulcers

Pulmonary infection

Genito urinary foci

Pyuria

- Leptospirosis

Headache

Myalgic

Fever

Conjunctival suffusion

- H/o Trauma to the eye
- Sexual history
- Systemic disease : HT

Diabetic

TB

Leprosy

Others

- Treatment History

  Medial - Topical

  Subconjunctival

  Subtenon

  Systemic

  Surgical

- Any previous attack

Ocular examination :

- Best corrected visual acuity R L
- Tension R L

Slit – lamp Examination

Lids

Conjunctiva - Congestion, nodules

Cornea - Sensation

Epithelium

Stroma

Endothelium

AC - Flare

Cells

Depth

Hypopyon

Iris	-	Colour / pattern
		Peripheral anterior synechiae
		Posterior synechiae
		Nodules / granulomas
		Vessels
Pupil	-	Size
		Shape
		Reaction to light
Lens	-	Normal
		Senile cataract
		Complicated cataract
Fundus	-	Media
		Vitreous
		Optic disc
		Vessels
		Retina
		Choroid
		Periphery

I/O

Lab tests :

Hb

ESR

TLC

DLC

VDRL

Mantoux

HIV

USG

FFA Chest / sacroiliac x ray

Ig MAT

Diagnosis :

Treatment : Medical / surgical

Follow up : Date :

BCVA :

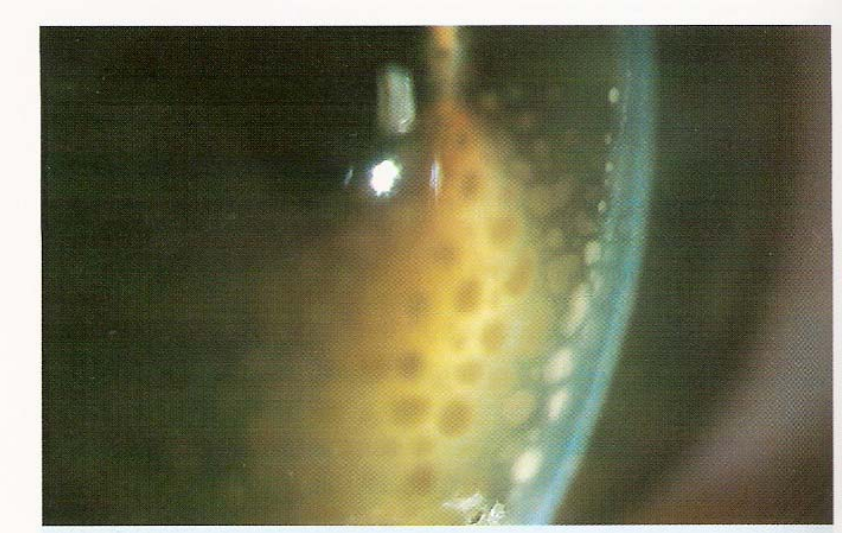
(Best corrected visual acuity)

Tension :

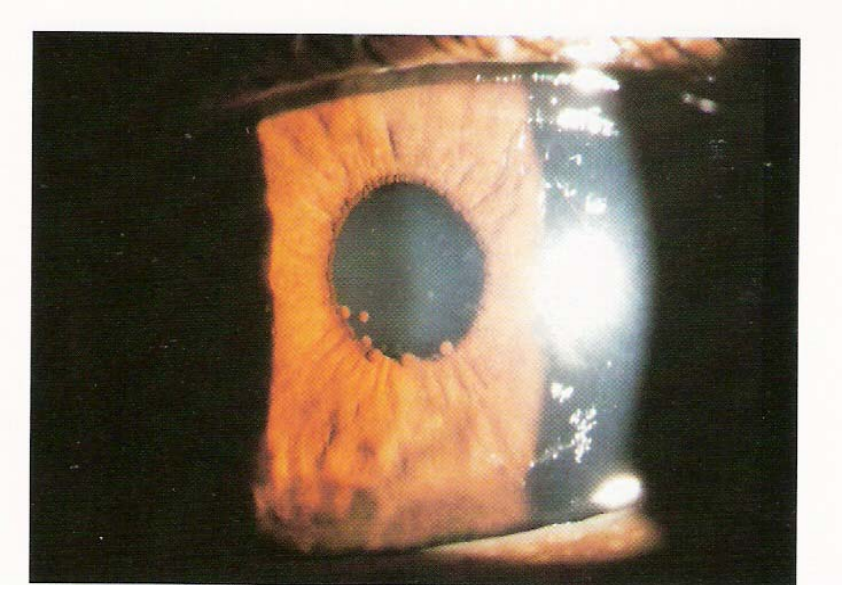
S/L /E

Fundus :

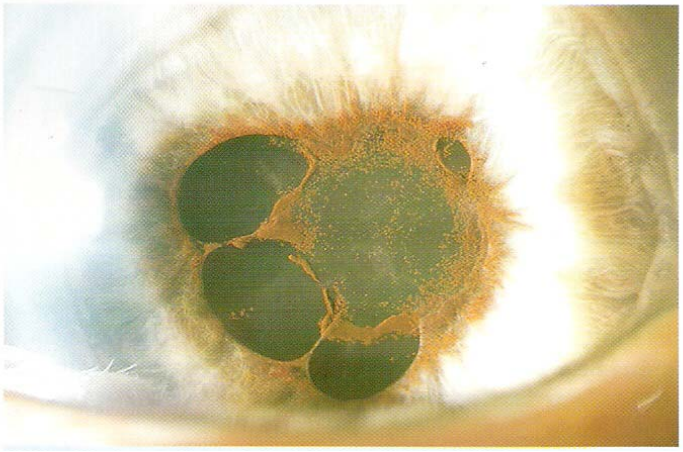
MUTTON FAT KERATIC PRECIPITATES



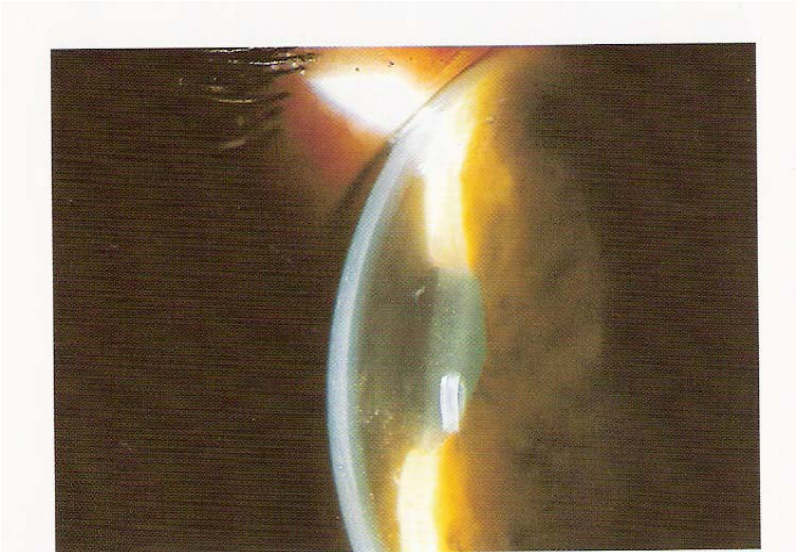
KOEPPE'S NODULES IN GRANULOMATOUS ANTERIOR UVEITIS



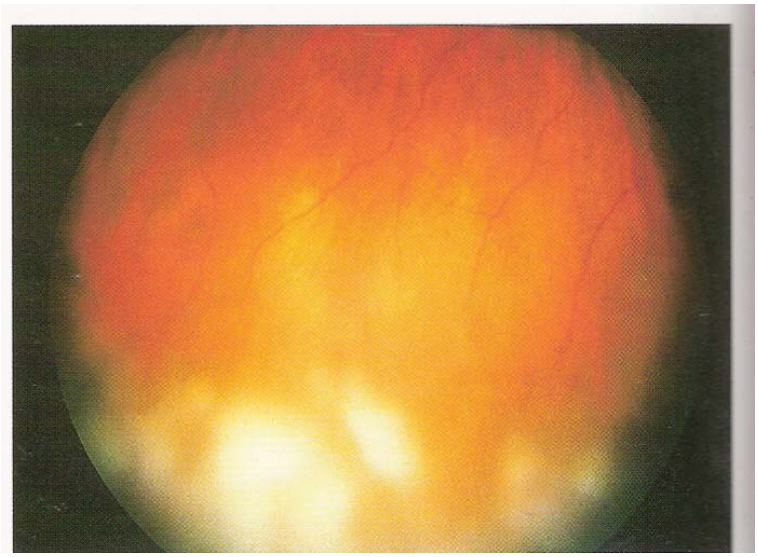
POSTERIOR SYNECHIAE



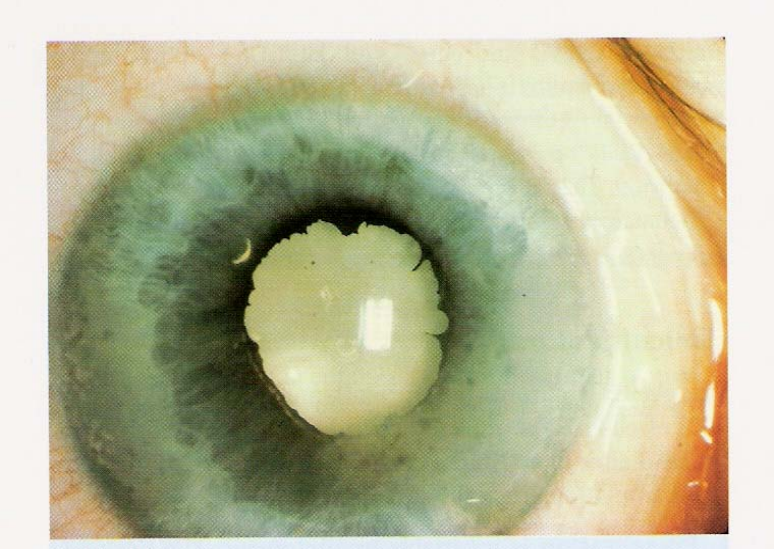
IRIS BOMBE



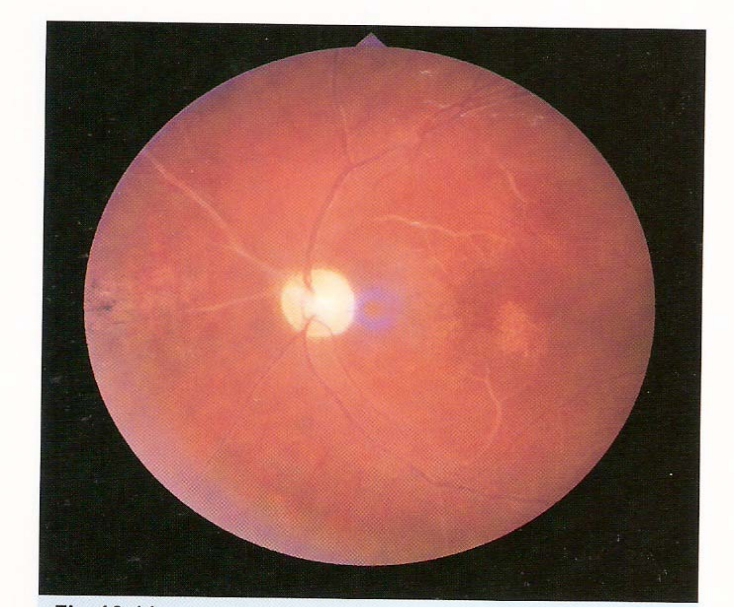
VITREOUS COTTON BALLS



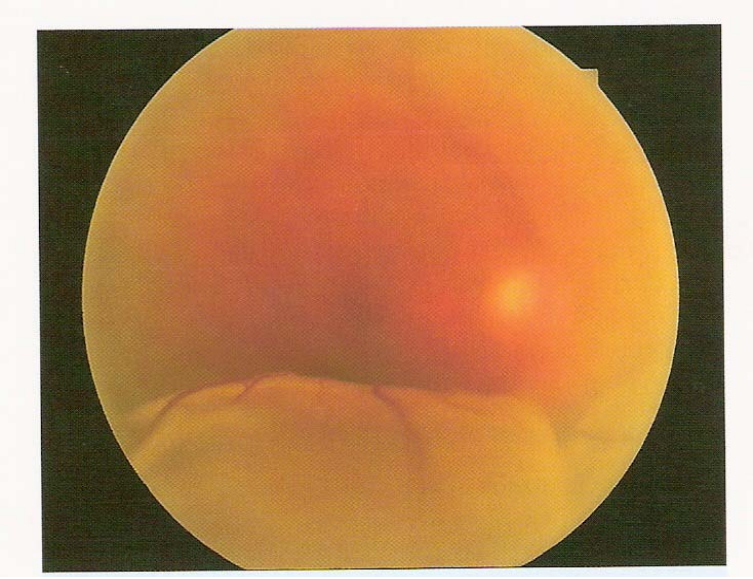
COMPLICATED CATARACT



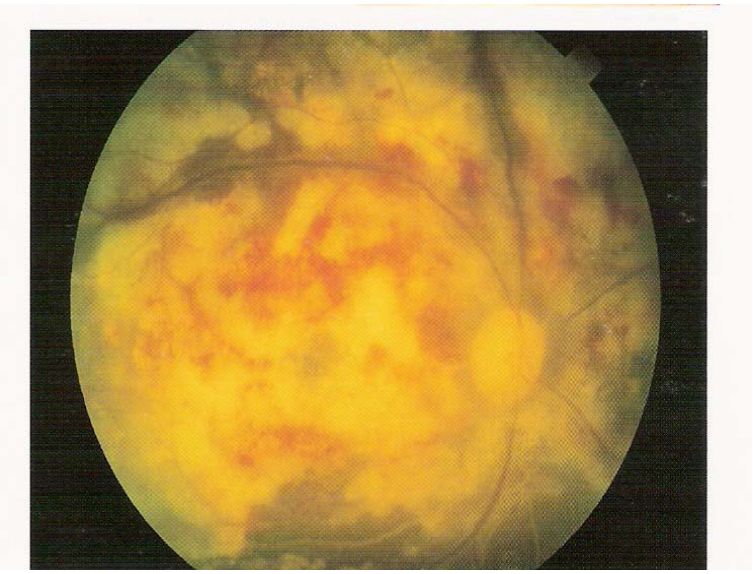
CONSECUTIVE OPTIC ATROPHY IN BEHCET'S DISEASE



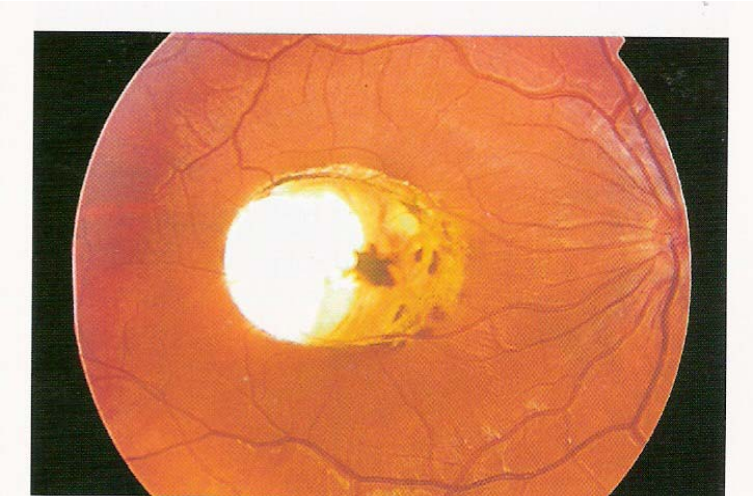
EXUDATIVE RETINAL DETACHMENT



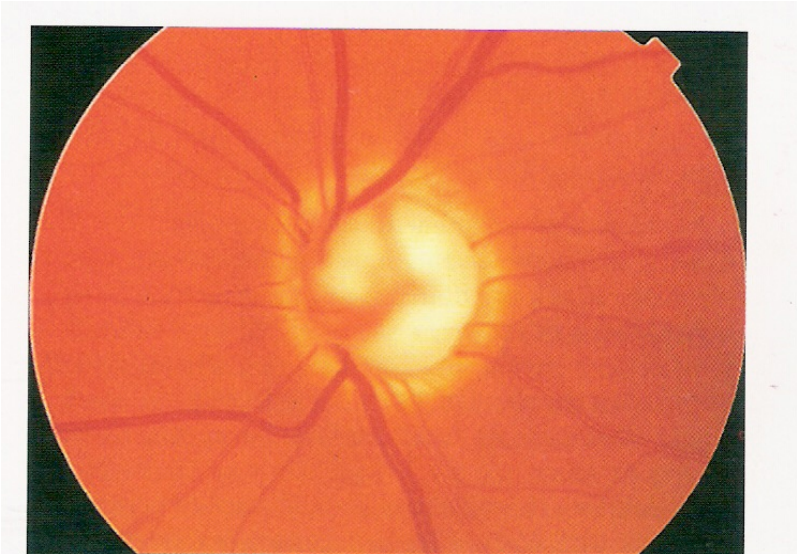
CMV RETINITIS



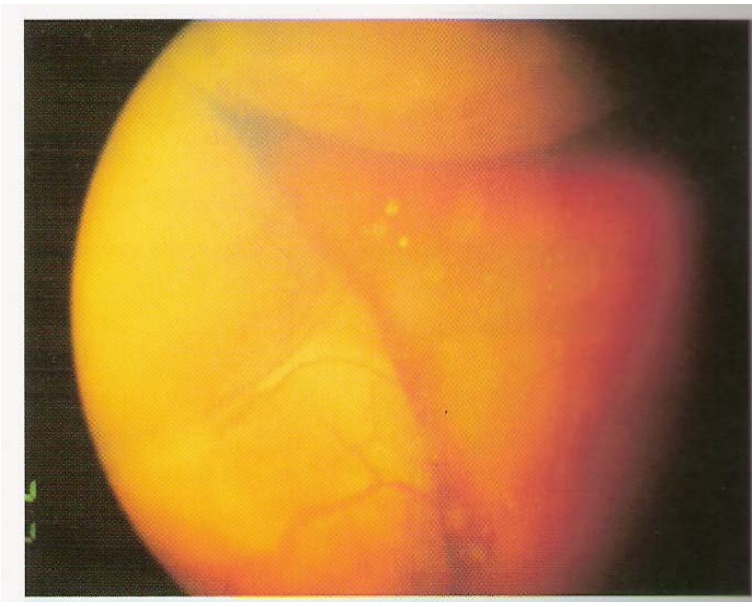
MACULAR SCAR



GLAUCOMATOUS OPTIC ATROPHY



CHOROIDAL DETACHMENT



MASTER CHART

S. No.	Name	Age	Sex	Late rality	Course	Anatomic Location	Etiology	Visual Acuity	Degree of visual loss	Cause of visual loss	Compli cations
1.	Baskar	15	M	U	C	ANT	Idiopathic	6/6 - 6/18	-	-	-
2.	Gautam	16	M	U	A	ANT	Tr. A.U.	6/12 – 6/6	-	-	-
3	Ravi	20	M	B	C	INT	Idiopathic	6/12 – 6/18	-	-	-
4.	Geetha	40	F	B	C	POST	Toxopl	2/60 – 6/36	Severe	M.patho	M. Patho
5.	Jegadeesh	27	F	B	A	POST	ARN	6/60 – 6/36	Moderate	CME	CME
6.	Alagarsamy	35	M	B	C	PAN	Idiopathic	6/60 – 6/36	Moderate	Cataract	Cataract
7.	Benjamin	25	M	B	C	INT	Parsplanitis	6/24 – 6/36	Moderate	CME	CME
8.	Manickam	59	M	B	C	PAN	TB	6/18 – 6/60	Moderate	RD	RD
9.	Kamala	28	F	U	A	ANT	Idiopathic	6/60 – 6/12	Moderate	Multiple	Multiple
10.	Muthiah	58	M	B	A	ANT	Idiopathic	6/18 – 6/6	-	-	-
11.	Chithra	27	F	U	C	ANT	Fuch’s	6/18 – 6/6	-	-	-
12.	Malaichamy	55	M	B	C	PAN	Sarcoidosis	6/60 – 6/36	Moderate	Cataract & CME	Cataract &CME
13.	Pandithurai	39	M	U	C	INT	Idiopathic	6/36 – 6/6	Moderate	Vitritis	Vitritis
14.	Rakkappakonar	52	M	U	A	ANT	Idiopathic	6/6 – 6/18	-	-	-
15.	Nattamani	29	M	B	C	POST	CMV	6/36 – 6/60	Moderate	CME	CME
16.	Ramesh	22	M	B	A	ANT	Idiopathic	6/6 – 6/12	-	-	-
17.	Saraswathy	30	F	B	C	PAN	En.Endoph	6/24 – 6/36	Moderate	Vitritis	Vitritis
18.	Ram	18	M	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
19.	Rajamani	40	M	B	C	INT	Idiopathic	6/60 – 6/18	Moderate	Choroidal Detachment	Chroidal Detachment
20.	Jeevanam	50	F	U	C	INT	Idiopathic	6/12 – 6/6	-	-	-
21.	Parthiban	50	F	B	C	INT	Toxopl	6/36 – 6/24	Moderate	Vitritis	Vitritis
22.	Puchendu	54	M	B	A	PAN	TB	6/18 – 6/12	-	-	-

23.	Ramjan beevi	55	F	U	A	ANT	Sc.K.U	6/6 – 6/18	-	-	-
24.	Muthupandy	40	M	U	C	ANT	FUCH's	6/6 – 6/18	-	-	Glaucoma
25.	Thangam	47	F	B	C	INT	Parsplantis	6/24 – 6/36	Moderate	Vitritis	Vitritis
26.	Sundaram	45	M	B	C	PAN	En.Endoph	6/36 – 6/18	Moderate	CME	CME
27.	Muthukumar	45	M	U	C	ANT	Posner-SC	6/18 – 6/6	-	-	-
28.	Firza Mohamed	27	M	B	C	POST	Toxopl	6/36 – 6/24	Moderate	Vitritis	Vitritis
29.	Iniyal	54	F	B	A	ANT	HLA	6/18 – 6/9	-	-	-
30.	Muthuvel	72	M	U	A	ANT	Idiopathic	6/18 – 6/6	-	-	Glaucoma
31.	Chinnathai	59	F	U	A	ANT	Idiopathic	6/18 – 6/6	-	-	Cataract
32.	Velu	73	M	B	C	ANT	Hansen's	2/60 – 2/60	Severe	Glaucoma	Glaucoma
33.	Guru	28	M	U	C	POST	CMV	6/18 -6/6	-	-	-
34.	Ayyavu	57	M	B	A	PAN	TB	6/18 – 6/18	-	-	-
35.	Pattu	55	F	U	A	ANT	Lens induc	6/6 – 6/18	-	-	-
36.	Chettithevar	56	M	U	A	ANT	Tr. A.U.	6/6 – 6/12	-	-	-
37.	Kayilarasi	44	F	B	A	ANT	Idiopathic	6/18 – 6/9	-	-	Glaucoma
38.	Mannakatti	58	M	U	A	ANT	Lens induc	6/6 -6/18	-	-	
39.	Konar	62	M	U	A	ANT	Viral KU	6/18 – 6/6	-	-	-
40.	Rajammal	30	F	B	C	POST	CMV	6/12 – 6/60	Moderate	RD	RD
41.	Mohammed	45	M	B	C	POST	CMV	2/60 1/60	Severe	RD	RD
42.	Rama subramanian	28	M	B	C	PAN	Behcet's	2/60 – 6/36	Severe	Optic atrophy	Optic atrophy
43.	Subbaiah	53	M	B	A	ANT	Idiopathic	6/18 – 6/12	-	-	-
44.	Meena	18	F	U	A	ANT	Idiopathic	6/6 -6/12	-	-	-
45.	Anthony	42	M	B	A	POST	ARN	2/60 – 1/60	Severe	Optic neuro	Optic Neuro
46.	Ramkumar	23	M	U	A	ANT	Idiopathic	6/18 -6/6	-	-	-
47.	Karammal	54	F	B	C	PAN	TB	6/36 -6/60	Moderate	Cataract & CME	Cataract & CME

48.	Kumari	25	F	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
49.	Rajesh	22	M	B	A	ANT	Lepto	6/12 – 6/12	-	-	-
50.	Mumtaj	40	F	B	C	POST	CMV	6/60 – 6/36	Moderate	Macular pathology	Macular pathology
51.	Rathinam	28	F	B	A	ANT	Idiopathic	6/36 – 6/18	Moderate	Multiple factors	Multiple factors
52.	Packiam	27	F	B	A	ANT	Idiopathic	6/6 – 6/18	-	-	-
53.	Balaji	17	M	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
54.	Karim	24	M	B	A	ANT	Lepto	6/12 – 6/18	-	-	-
55.	Rajarathinam	49	M	U	C	INT	Idiopathic	6/12 – 6/60	Moderate	Cataract & CME	Cataract & CME
56.	Pamban	30	M	B	C	PAN	VKH	6/60 6/60	Moderate	Macular pathology	Macular pathtology
57.	Ammavasi	44	M	U	C	POST	Idiopathic	6/12 – 6/60	Moderate	Cataract & CME	Cataract & CME
58.	Balaiah	55	M	B	A	ANT	Idiopathic	6/12 – 6/18	-	-	-
59.	Abirami	25	F	B	A	ANT	Lepto	6/6 – 6/0	-	-	-
60.	Prem	19	M	U	A	ANT	Idiopathic	6/6 – 6/12	-	-	-
61.	Karuppan	28	M	B	C	ANT	Fuch’s	6/9 – 6/6	-	-	-
62.	Mariammal	41	F	B	C	POST	TB	6/36 – 6/18	Moderate	Cataract	Cataract
63.	Shanthi	45	F	B	C	PAN	TB	6/36 – 6/60	Moderate	Cataract	Cataract
64.	Palani	57	M	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
65.	Anuradha	28	F	U	A	ANT	Tr. A.U.	2/60 – 6/6	Severe	CME	CME
66.	Rakkammal	42	F	B	C	POST	Idiopathic	6/60 – 6/36	Moderate	Cataract & CME	Cataract & CME
67.	Deepa	30	F	B	C	ANT	Fuch’s	6/36 – 6/36	Moderate	Cataract	Cataract
68.	Kajamaideen	28	M	B	A	ANT	TB	6/24 – 6/60	Moderate	Multiple factors	Multiple factors
69.	Muthuchamy	57	M	B	C	INT	Parsplantis	6/60 – 6/12	Moderate	Macular	Macular

										pathology	pathology
70.	Sameer	23	M	B	A	ANT	HLA	6/9 - 6/0	-	-	-
71.	Parvathy	40	F	U	A	ANT	Idiopathic	6/6 – 6/12	-	-	-
72.	Parvatham	45	F	B	A	ANT	HLA	6/9 – 6/12	-	-	-
73.	Vaiyan	35	M	B	C	PAN	TB	6/60 – 6/18	Moderate	CME	CME
74.	Balakumar	28	M	U	A	ANT	Sc.K.U.	6/12 -6/6	-	-	-
75.	Pillai	59	M	B	A	ANT	Idiopathic	6/60 – 6/36	-	-	-
76.	Kondangi	34	M	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
77.	Ambigai	42	F	B	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
78.	Laxmi	35	F	B	A	PAN	Lepto	6/36 – 6/24	Moderate	Multiple factors	Multiple factors
79.	Mannaru	32	M	B	A	ANT	Idiopathic	6/9 – 6/12	-	-	-
80.	Hema	39	F	U	A	ANT	HLA	6/6 – 6/18	-	-	-
81.	Karuppaiah	42	M	B	A	ANT	HLA	6/9 – 6/9	--	-	-
82.	Madhavan	35	M	U	A	ANT	Idiopathic	6/12 – 6/6	-	-	-
83.	Kalyani	35	F	B	A	ANT	TB	6/36 – 6/60	Moderate	Cataract	Cataract
84.	Mariammal	42	F	U	A	INT	Idiopathic	6/60 – 6/12	Moderate	Cataract	Cataract
85.	Arunagiri	46	M	B	C	PAN	TB	6/60 – 6/36	Moderate	Cataract	Cataract
86.	Madhivanan	40	M	B	A	ANT	HLA	6/6 – 6/9	-	-	-
87.	Karuppasamy	36	M	U	A	ANT	Idiopathic	6/9 – 6/6	-	-	-
88.	Ratna	32	F	B	A	ANT	Lepto	6/9 – 6/6	-	-	-
89.	Raman	34	M	U	A	ANT	Lepto	6/9 – 6/6	-	-	-
90.	Imayam	44	F	U	A	ANT	Tr.A.U.	6/18 – 6/6	-	-	-
91.	Sujad begum	45	F	U	C	INT	Idiopathic	6/6 – 6/18	-	-	Vitritis
92.	Amirtham	28	F	B	C	POST	Idiopathic	6/9 – 6/18	-	-	Optic disc edema
93.	Alagu	46	F	B	C	PAN	Sarcodosis	6/36 – 6/24	Moderate	Glaucoma	Glaucoma
94.	Raja	40	M	B	A	ANT	Idiopathic	6/9 – 6/9	-	-	

95.	Kalpana	40	F	U	C	ANT	Fuch's	6/6 – 6/9	-	-	-
96.	Ganeshpandi	29	M	B	C	PAN	Sarcodosis	6/60 – 6/18	Moderate	CME	CME
97.	Karupayee	74	F	U	A	ANT	Idiopathic	6/18 – 6/6	-	-	-
98.	Pandi	40	M	U	A	ANT	Tr. A.U	6/9 – 6/6	-	-	-
99.	Pottaiammal	76	F	B	A	ANT	Idiopathic	6/18 – 6/9	-	-	-
100	Rakkumuthu	42	M	U	A	ANT	Tr.A.U	6/6 – 6/9	-	-	-

MASTER CHART KEYS

M	-	Male
F	-	Female
A	-	Acute
C	-	Chronic
U	-	Unilateral
B	-	Bilateral
ANT	-	Anterior Uveitis
POST	-	Posterior Uveitis
INT	-	Intermediate Uveitis
PAN	-	Pan Uveitis
Tr.A.U	-	Traumatic Anterior Uveitis
Toxopl	-	Toxoplasmosis
CMV	-	Cyclomegalo virus retinitis
ACE	-	Angiotensin Converting Enyme
Fuch's	-	Fuch's Heterochromic uveitis
En. Endopn	-	Endogenous endophthalmitis
Sc. K.U.	-	Sclero kerato uveitis
Posner Sc	-	Posner Scholssman syndrome
HLA	-	Human leucocyte antigen B-27 -
Viral K.U.	-	Viral kerato uveitis
Lepto	-	Leptospiral uveitis
VKH	-	Vogt Koyanagi Harada's disease
CME	-	Cystoid macular edema

ABBREVIATIONS USED

AIDS - Aquired Immunodeficiency Syndrome

VDRL - Venereal Disease Research Laboratory test

FTA-ABS - Fluorescent Treponemal Antibody Absorbtion test

ELISA - Enzyme Linked Immuno Sorbent Assay

HIV - Human Immunodeficiency Virus

WHO - World Health Organisation

TLC - Total Leucocyte Count

DLC - Differential Leucocyte Count

FFA - Fundus Fluorescein Angiography

IgMAT - Immunoglobulin MicroAgglutination Test

S/L/E - Slit Lamp Examination

ESR - Erythrocyte Sedimentation Rate

Hb - Hemoglogin

RA - Rheumatoid Arthritis

CNS - Central Nervous System

RD - Retinal Detachment

HT - Hypertension

TB - Tuberculosis

AC - Anterior Chamber

I/O - Indirect Ophthalmoscopy

JRA - Juvenile Rheumatoid Arthritis

KP - Keratic Precipitates

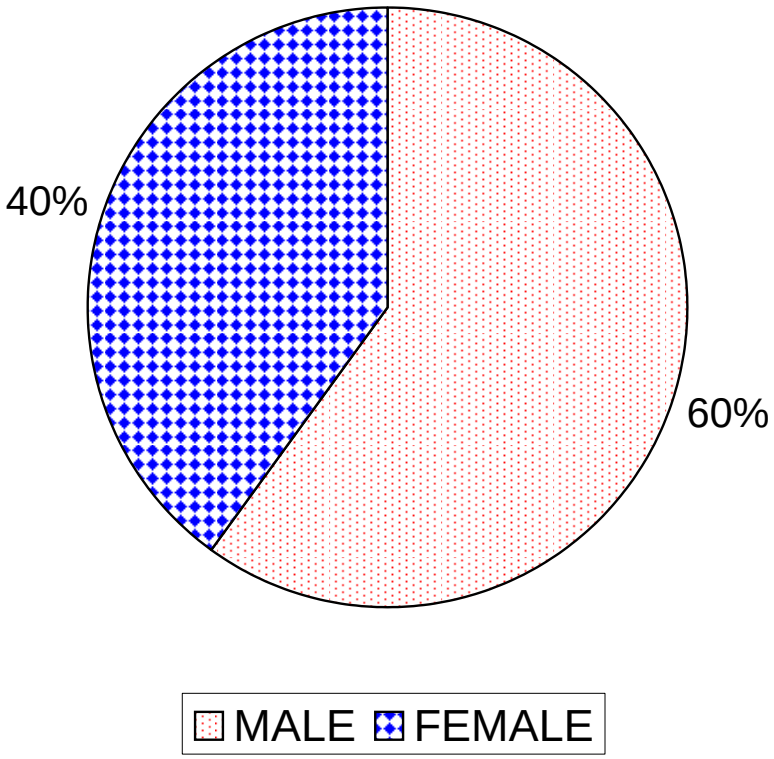
ANA - Anti Nuclear Antibody

PCR - Polymerase Chain Reaction

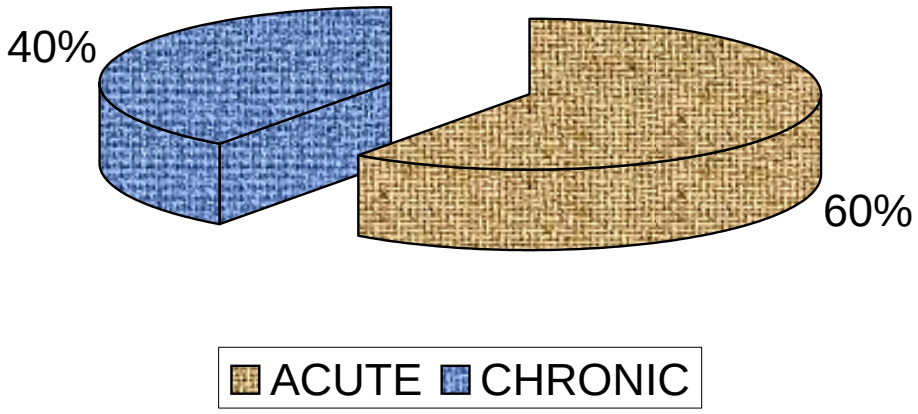
DNA - De-oxy riboNucleic Acid

ACE - Angiotensin Converting Enyme

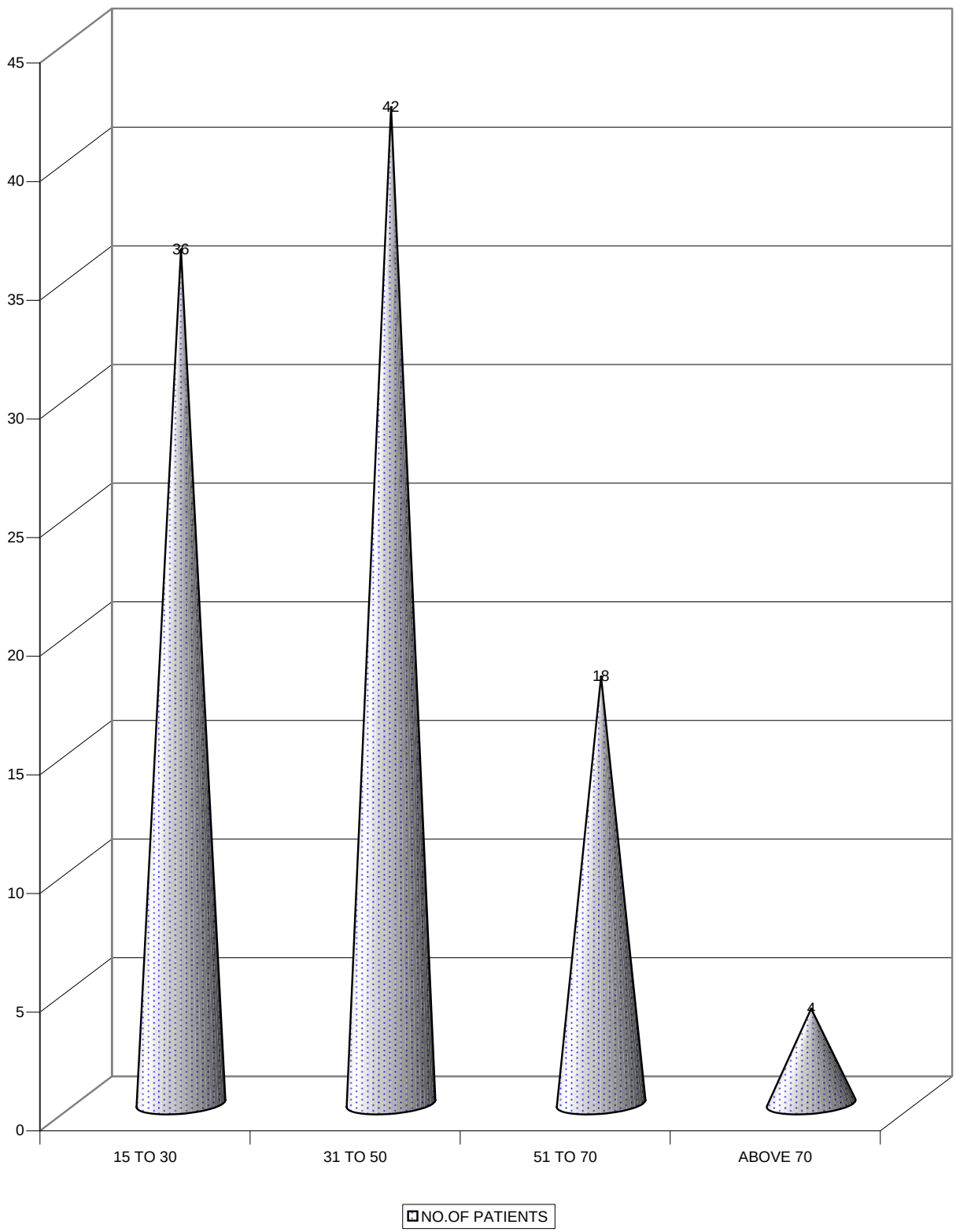
GENDER DISTRIBUTION

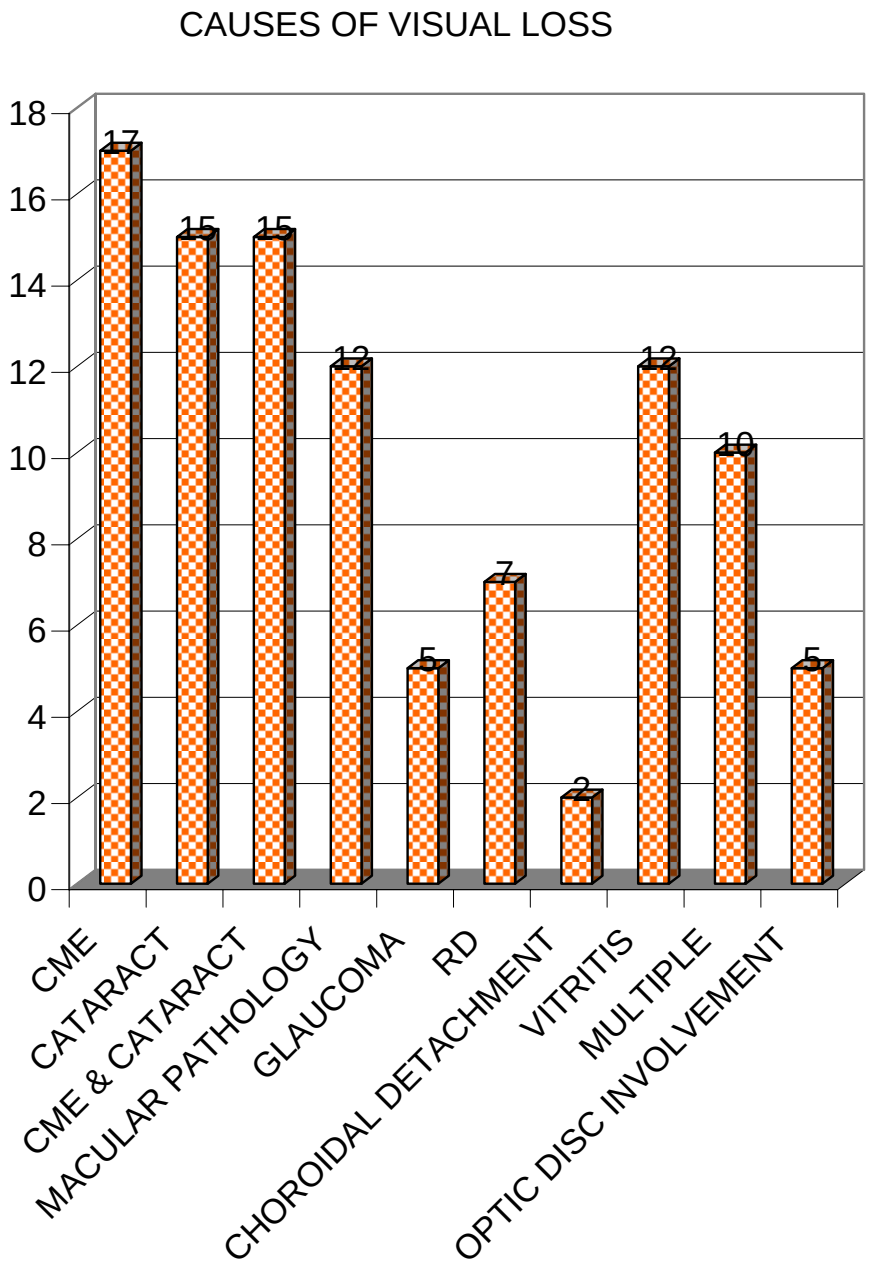


COURSE OF DISEASES

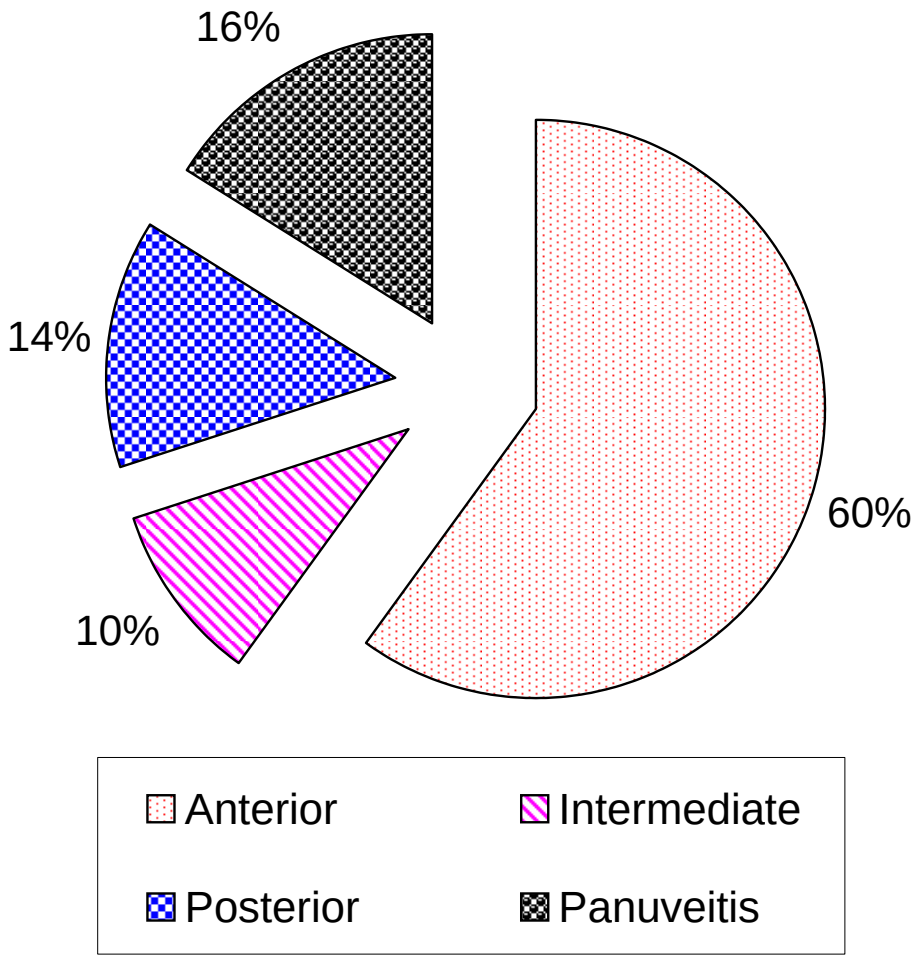


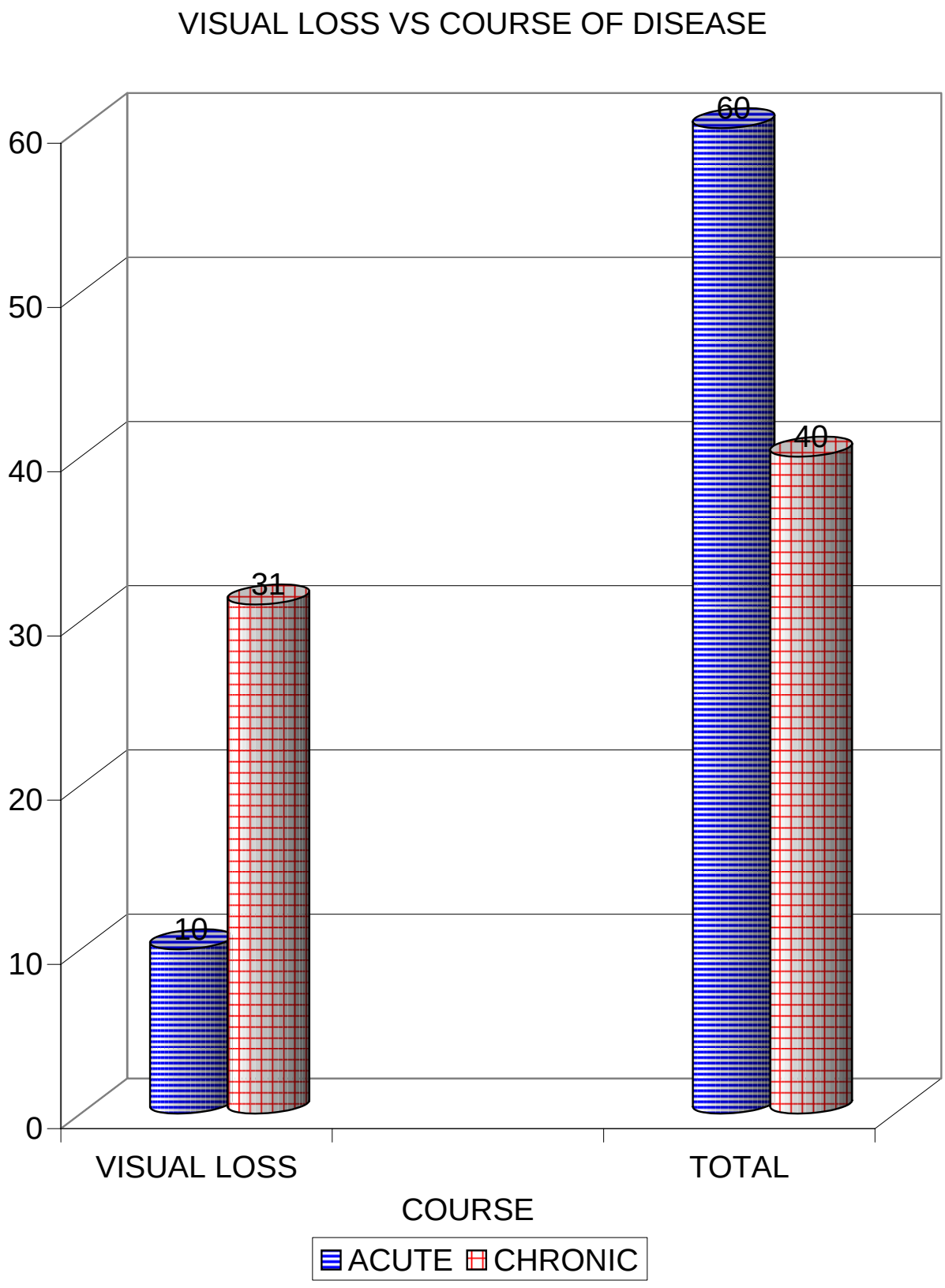
AGE DISTRIBUTION

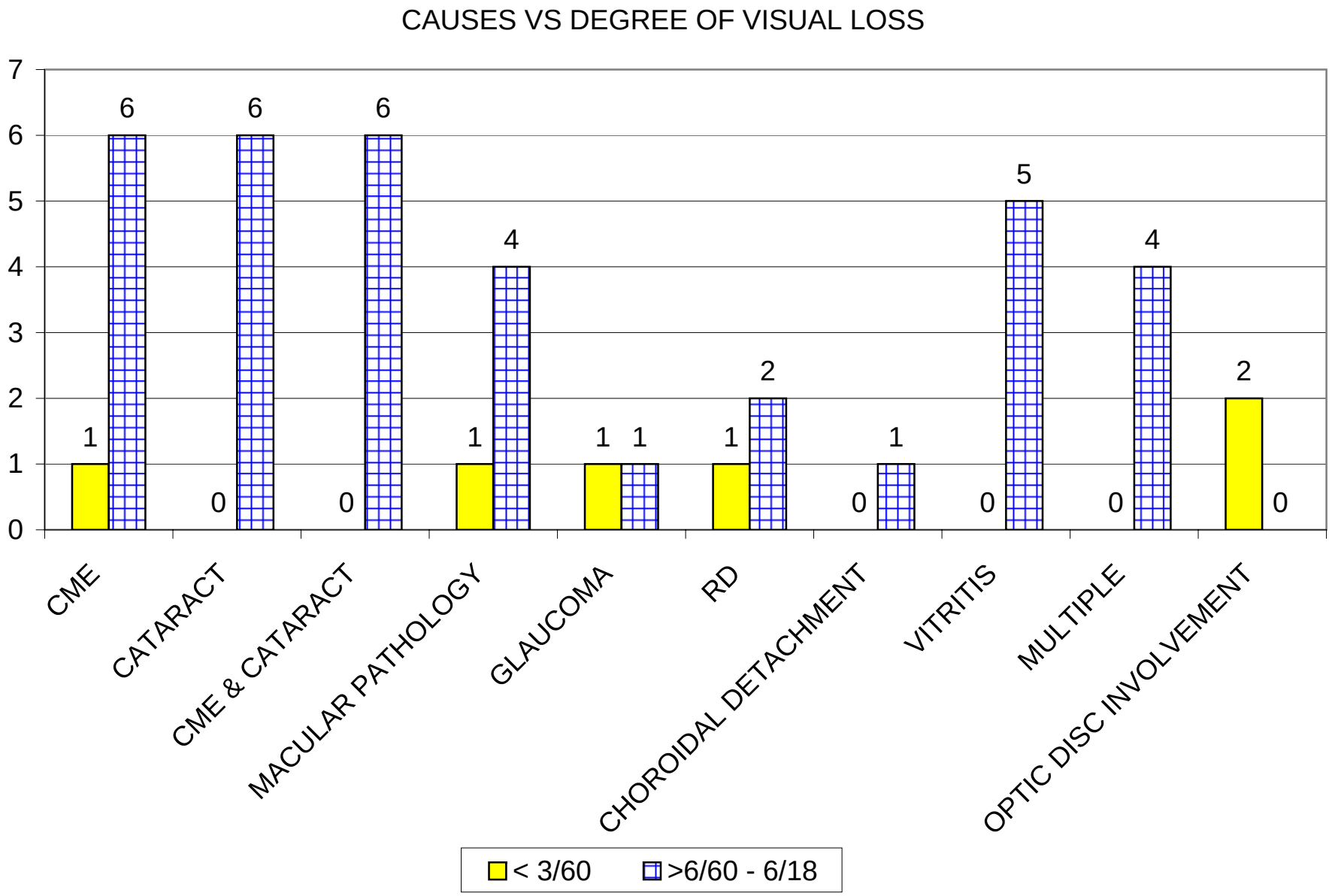



CAUSES OF VISUAL LOSS
18
16
14
12
10
8
6
4
2
0
17
15
15
12
5
7
2
12
10
5
CME
CATARACT
CME & CATARACT
MACULAR PATHOLOGY
GLAUCOMA
RD
CHOROIDAL DETACHMENT
VITRITIS
MULTIPLE
OPTIC DISC INVOLVEMENT
CAUSES

ANATOMIC LOCATION OF UVEITIS




VISUAL LOSS VS COURSE OF DISEASE
60
50
40
30
20
10
0
10
31
60
40
VISUAL LOSS
TOTAL
COURSE
ACUTE
CHRONIC


CAUSES VS DEGREE OF VISUAL LOSS
7
6
5
4
3
2
1
0
6
6
6
4
5
4
2
1
0
0
1
1
1
2
1
0
0
0
2
0
CME
CATARACT
CME & CATARACT
MACULAR PATHOLOGY
GLAUCOMA
RD
CHOROIDAL DETACHMENT
VITRITIS
MULTIPLE
OPTIC DISC INVOLVEMENT
< 3/60
>6/60 - 6/18

MALE	60
FEMALE	40

ACUTE	60
CHRONIC	40

AGE GROUP	PERCENTAGE
15 TO 30	36
31 TO 50	42
51 TO 70	18
ABOVE 70	4

Anterior	60
Intermediate	10
Posterior	14
Panuveitis	16

CME	17
CATARACT	15
CME & CATARACT	15
MACULAR PATHOLOGY	12
GLAUCOMA	5
RD	7
CHOROIDAL DETACHMENT	2
VITRITIS	12
MULTIPLE	10
OPTIC DISC INVOLVEMENT	5

	< 3/60	≥6/60 - 6/18
CME	1	6
CATARACT	0	6
CME & CATARACT	0	6
MACULAR PATHOLOGY	1	4
GLAUCOMA	1	1
RD	1	2
CHOROIDAL DETACHMENT	0	1
VITRITIS	0	5
MULTIPLE	0	4
OPTIC DISC INVOLVEMENT	2	0

COURSE	VISUAL LOSS	TOTAL
ACUTE	10	60
CHRONIC	31	40

CME	17	27
CATARACT	15	18
COMBINATION	15	20